DOCUMENT RESUME

ED 237 776 CE 037 844

AUTHOR	Sticht, Thomas G.
TITLE	Basic Skills in Defense. Professional Paper 3-82.
INSTITUTION	Human Resources Research Organization, Alexandria, Va.
SPONS AGENCY	Office of the Assistant Secretary of Defense for Manpower, Reserve Affairs and Logistics (DOD), Washington, DC.
REPORT NO	HumRRO-PP-3-82
PUB DATE	Jun 82
CONTRACT	MDA903-81-M-8831
NOTE	69p.
PUB TYPE	Reports - Research/Technical (143) -- Information Analyses (070)
EDRS PRICE	MF01/PC03 Plus Postage.
DESCRIPTORS	Adult Basic Education; Adult Literacy; Adult Programs; *Basic Skills; *Cost Effectiveness; Educational Needs; *Literacy Education; *Military Training; Outcomes of Education; Postsecondary Education; *Program Effectiveness; Skill Development

ABSTRACT

This report was prepared to fulfill the need for an information source on basic skills in the armed services. To prepare the report, researchers obtained and reviewed published literature from various document files. Service representatives of the Joint Service Working Group on Literacy/Basic Skills established by the Assistant Secretary of Defense prepared papers describing their service's basic skills programs, ongoing and projected. In addition, site visits were made to training programs. Results of the literature review indicated that for some two hundred years, a debate has taken place among those responsible for military training that focuses on the role of the military in providing basic skills training for undereducated applicants for military service. A representative sample of the major arguments in the debate was compiled. In general, arguments against the teaching of basic skills in the military focus on pointing to the undesirability of permitting the less literate to enter military service, the costs of training the less literate, the use of limited assignments in lieu of basic skills training, and the ineffectiveness of basic skills programs in improving either basic skills or job performance. Those arguing for the teaching of basic skills counter that many less literate personnel perform as well as more highly literate ones, that screening instruments are not adequate to distinguish the inadequate, that avoiding the use of less literate persons in peacetime prevents their acquisition of training experience when mobilization requires their use, that literacy training can be cost effective, and that less literate persons are required to fill slots in a volunteer military service. Research bearing on the debate was examined in three areas: selection and classification, job training, and job performance. (KC)

Professional
Paper
3-82

HumRRO-PP-3-82

ED237776

HumRRO

Basic Skills in Defense

Thomas G. Sticht

HUMAN RESOURCES RESEARCH ORGANIZATION
300 North Washington Street • Alexandria, Virginia 22314

Approved for public release; distribution unlimited.

June 1982

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION
CENTER (ERIC)

This document has been reproduced as received from the person or organization originating it.
Minor changes have been made to improve reproduction quality.

Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

CE 037814

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) BASIC SKILLS IN DEFENSE		5. TYPE OF REPORT & PERIOD COVERED Final Report
		6. PERFORMING ORG. REPORT NUMBER FR-ETSD-82-6
7. AUTHOR(s) Thomas G. Sticht		8. CONTRACT OR GRANT NUMBER(s) MDA903-81-M-8831
9. PERFORMING ORGANIZATION NAME AND ADDRESS Human Resources Research Organization 1100 S. Washington St. Alexandria, VA 22314		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS Office of the Assistant Secretary of Defense (Manpower, Reserve Affairs & Logistics) Washington, DC 20301		12. REPORT DATE March 1982 13. NUMBER OF PAGES 51
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office)		15. SECURITY CLASS. (of this report) Unclassified 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release, distribution unlimited.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

Research performed under HumRRO Project BALID.

Also publised as HumRRO Professional Paper 3-82, June 1982.

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

basic skills education
basic skills
adult basic education
basic skills in the armed services

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report was prepared to fulfill the need for an information source on basic skills in the armed services. To prepare the report, published literature from various document files was obtained and reviewed. Service representatives of the Joint Service Working Group on Literacy/Basic Skills, established by the Assistant Secretary of Defense (Manpower, Reserve Affairs and Logistics, in 1980, prepared papers describing their Service's basic skills programs, ongoing and projected. This document was intended to be

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

used by the Working Group as a reference in considering policy for basic skills education and as a source of information for the public regarding military basic skills programs.

FOREWORD

On May 27, 1980 the Assistant Secretary of Defense (Manpower, Reserve Affairs and Logistics) established the Joint Service Working Group on Literacy/Basic Skills for the purpose of coordinating basic skills activities among offices of the Department of Defense and the Air Force, Army, Marine Corps and Navy. Membership in the Working Group consists of Service basic skills and testing policy staff officers, scientists representing each Service's personnel research laboratory, and representatives from the Office of the Assistant Secretary of Defense (Manpower, Reserve Affairs, and Logistics), Directorate for Training and Education.

At its first meeting on May 27, 1980, the Working Group agreed to pursue the following objectives:

- Define the needs of each Service for basic skills education.
- Determine the nature, extent, and success of current basic skills programs.
- Provide policy recommendations on the development and implementation of basic skills programs.
- Resolve problems in basic skills research, implementation and operation.
- Share research activities within each of the Services and civilian community (as necessary) on specific literacy issues such as the changing nature of literacy, definitions of and uses for literacy.
- Propose and develop joint Services' programs, with resource requirements that would be included as part of the Planning, Programming and Budgeting System cycle.

In early meetings of the Working Group, it was determined that the Services provide a variety of basic skills programs and that the approach to basic skills training within the Services is undergoing considerable change as a consequence of research and development efforts within the Services and in civilian institutions in the last decade and a half. For these reasons the Working Group concluded that a need exists for a document that reviews the Service's basic skills programs—past, present, and projected. Such a document could assist the Working Group in cooperating to produce a coherent policy for basic skills education in the Department of Defense. Additionally, the document would be useful for providing information to the public about basic skills programs within the Department of Defense.

To prepare this document, Service representatives to the Working Group prepared papers describing their Service's basic skills programs and related research. These papers were reviewed, revised, and approved by various staff offices in the four Services and then submitted to the Chair of the Working Group. The present report used the Service papers as primary information sources, and supplemented them with a review of additional documents describing basic skills research, development, and programs in the Services. Additionally, site visits were made to several military and civilian installations to obtain first-hand knowledge of basic skills problems and programs. Finally, an initial draft of this report was prepared and circulated to the four Services and several civilian reviewers for comment.

Thanks are due, and hereby given, to all those who provided information and to the members of the Working Group and the staff officers in the various Services who wrote and/or reviewed the primary source documents on which this report is based. A special note of thanks is given to Ms. Sandra (Sandy) Robinson who provided staff assistance (and considerable guidance) to the Working Group, and who stimulated the preparation of this report prior to her departure from a year's stay with the OASD (MRA&L) Directorate of Education and Training.

Special recognition is also due to Dr. Patricia Hanen, OASD(MRA&L) who provided guidance for the preparation of the report and to Dr. Lydia Hooke of HumRRO for her preparation of the detailed tables of Chapter 3.

EXECUTIVE SUMMARY

In 1980, the Assistant Secretary of Defense (Manpower, Reserve Affairs and Logistics) established the Joint Service Working Group on Literacy/Basic Skills for the purpose of coordinating basic skills policies and activities among the Department of Defense, the Air Force, Army, Marine Corps, and Navy.

Early on the Working Group determined that a need existed for a document that surveys and compiles information about military basic skills issues and the basic skills programs conducted by the Services. Such a document could be used by the Working Group as a reference in considering policy for basic skills education and as a source of information for the public regarding military basic skills programs.

APPROACH

The present report was prepared to fulfill the need for an information source on basic skills in the armed services. To prepare the report, published literature from various document files was obtained and reviewed. Additionally, Service representatives to the Working Group prepared papers describing their Service's basic skills programs, ongoing and projected. Site visits were conducted to observe several of the military basic skills programs reported by the Services.

Based on the foregoing, a draft report was prepared and submitted to each Service for review. Additionally, comments were solicited from several civilian adult educators. The present report incorporates the comments of these military and civilian reviewers.

FINDINGS

Results of literature review indicated that for some two hundred years a "great debate" has taken place among those responsible for military manpower recruitment, accession, training, and education that focusses on the role of the military in providing basic skills training for undereducated applicants for military service. A representative sample of the major arguments in the great debate was compiled. In general, arguments against the teaching of basic skills in the military focus on (1) avoiding the problem by pointing to the undesirable performance consequences of admitting the less literate to enter military service; (2) the problems and costs of training the less literate; (3) the use of limited assignments in lieu of basic skills training; and (4) the ineffectiveness of basic skills programs in improving either basic skills or job training and performance.

Those arguing for the teaching of basic skills in the armed forces counter those arguing against such training by submitting that (1) many less literate personnel perform as well as more highly literate personnel and screening instruments are not accurate enough to distinguish the potentially adequate from the inadequate; (2) avoiding the marginally literate in peace time prevents the acquisition of leadership and training experience in training such personnel when mobilization requires their use; (3) literacy training

and job skills training can be cost-effectively modified to improve the proficiency of the undereducated; and (4) demographics of the available manpower pool indicate that the use of a significant number of marginally literate personnel will not be avoidable in the foreseeable future under voluntary service policies and with the need to train and retain personnel in highly technical fields.

Research bearing on the arguments in the great debate was examined in three areas: selection and classification, job training, and job performance. Evidence was found to support the following conclusions.

Regarding Selection and Classification

- The military services pose demands for basic skills equal to or greater than those of civilian jobs, and therefore they cannot accommodate less capable people than can other segments of society, e.g., industry and business.
- The revised Armed Forces Qualification Test (AFQT) is now comprised of a Reading (Word Knowledge and Paragraph Comprehension) component and a Mathematics (Numerical Operations and Arithmetic Reasoning) component. As such it provides the military with a screening test for basic skills.
- Reading levels of military accessions are now approximately the same as the young population from which the military recruits. This results from the use of the new AFQT as a basic skills screening test, and the setting of higher standards for enlistment.
- Even with higher standards for enlistment, many military recruits are below average in basic skills. Native oral language comprehension, learning skills, and not just reading are problems for the least able enlistees.
- It is difficult to accurately measure the learning and performance potential of applicants for military service, even with the revised and refined Armed Services Vocational Aptitude Battery.

Regarding Training

- Attrition is highest for those lowest in basic skills, and is more highly related to the demands for basic skills use during "academic" as contrasted with "performance" phases of training. Yet the majority of the least capable did not attrite from either phase of training in the studies reviewed.
- Removing reading demands of training by substituting listening or one-on-one, audio-visually supported live instruction did not remove learning differences between groups of trainees scoring high or low in basic skills in the studies reviewed. Yet many of the least skilled learned as well as the most skilled.

Regarding Job Performance

- AFQT, reading, listening, and arithmetic skills are positively correlated with paper-and-pencil job knowledge tests and hands-on job sample tests such as

used in the Army's Skill Qualification Testing program. Yet in work reviewed many of the highest skilled were in the bottom half of performers on hands-on tests, while many (e.g., 33% of the least skilled were in the top half of performers on such tests.

- The most highly skilled, non-high school graduates in one study had a job success rate equal to those having the lowest basic skill levels among high school graduates. Thus, basic skills competence, per se, does not appear to be the overriding determinant of success in the military.
- All Services have education credential requirements for non-commissioned officer ranks which, if not satisfied, lessen the chance for career progression to positions of leadership.

A review of basic skills policies and practices in the Department of Defense and the Services revealed the following.

Regarding Basic Skills Policy

- The Congress has directed that high-school diploma programs be attended only during off-duty time and that only job-related remedial basic skills education can be conducted during duty hours. But the meanings of "job-related" or "duty time" terms are unspecified by the Congress.
- The DoD follows a policy of decentralized management of the Services and directs that "Educational programs shall be established to provide opportunities for military personnel to achieve educational, vocational, and career goals . . ." (DoD Directive, Number 1322.8, February 4, 1980). This same directive defines off-duty time as "Time when the Military Service member is not scheduled to perform official duties." Since military service commanders are responsible for the scheduling of official duties, this definition of off-duty time permits the Services great flexibility in adhering to Congressional and Department of Defense directives.
- Within each of the armed services, then, policies of decentralized management act to guide the formulation of regulations that govern how each service follows the Department of Defense policy regarding basic skills education. Flexibility is permitted by the language used in the Department of Defense Directive cited above. This allows local commanders to tailor basic skills programs and participation to the needs of their mission and assigned personnel. Thus if on-duty basic skills programs are a drain on personnel that distracts from military readiness it is due to and remediable by local military commanders.

Regarding Basic Skills Programs in the Military

- Though enlistment standards were raised and the numbers of the very least skilled in the basics were reduced, enrollments in basic skills programs increased by 32% from fiscal year 1979 through fiscal year 1981. During fiscal year 1981, basic skills education in the four Services involved more than 200,000 course enrollments with combined contract and student costs in excess of $70 million.
- There is today an array of basic skills programs in operation in the military services, with others under development. Each Service establishes different kinds of on-duty basic skills programs with different criteria for entry, different assessment devices, different length of instruction, decentralized management,

little systematic evaluation, assorted materials, and they obtain gains in reading ranging from less than one grade level to almost three grade levels, with no apparent relationship of gain to time or resources.

- Basic skills programs appear to serve a multiplicity of management functions. They are to improve military job-related basic skills (the Army BSEP program); enhance learning ability, speedup progression through the ranks, reduce behavioral problems (the Navy BEST program); develop NCO leadership potential (the Army ASEP program); and improve "understanding of adult values and responsibilities" (the Air Force STEP program). Because these skills may be defined as job-related, as in the Department of Defense directives, learning them may be defined as an official duty, and programs teaching them can be offered during duty hours.
- Over 95% of the trainees who receive basic skills education attend programs designed by and delivered by civilian educational institutions under contract to the military. Comparisons of the gains made by civilians teaching military students to civilians teaching civilian students indicate that the programs for the military achieve in the same, highly variable manner as do the programs for civilians. A gross estimate of expected achievement in such adult basic education programs is one grade level for 80-120 hours of instruction, with wide variation within this range.
- To date, only the military programs that focus directly on the teaching of job-specific literacy tasks have demonstrated a positive and enduring effect of literacy training on job performance—if the performance of job reading tasks is considered as job performance (Army's AITPT, Air Force's JORP; and Navy's JOBS programs). Interim evaluation of the Navy's JOBS program suggests that attrition rates in technical training and the months beyond may be reduced due to job-oriented prerequisite (basic skills) training.

CONCLUSIONS

At the present time, the "great debate" is unresolved. Consequently, though the military services are directed by the Department of Defense to make basic skills education available, the programs are to be voluntary and conducted off-duty if they are aimed at high school completion, and on-duty if they are aimed at improving job learning or performance. The final responsibility for actually implementing and utilizing basic skills programs is delegated through each military service chain of command down to the level of an installation commander.

In this debate, then, there may be something of the nature of a self-fulfilling prophecy. If leadership is "for" basic skills education, it may be successful. If leadership is "against" basic skills education, it may fail. The debate has endured for two hundred years, and adult basic skills education in the military has suffered. Yet, there are signs that the new functional approaches to adult basic education that are emerging may, when fully incorporated into the military, render the debate moot.

If the trend toward functional or job-oriented basic skills training continues in the military, it may be possible to show more systematic improvement of skills in performing job-related basic skills tasks as the first line of evidence for the effectiveness and utility of basic skills training. If basic skills programs cannot demonstrate that

they improve the performance of job tasks involving reading, arithmetic, and other basic skills, then it is difficult to understand why such non-improvement of basic skills should be expected to affect learning in technical school or performance on the job.

Similarly, if functional basic skills programs can simultaneously provide job-relevant skills and contribute toward the satisfaction of high school credential requirements, as the Army's projected Functional Basic Skills Education Program aims to do, then the distinction between on-duty basic skills training and off-duty education for career-progression will diminish.

If the current trend toward job- and career-oriented basic skills education continues then the debate will have resolved itself. The distinctions between basic skills, technical skills, and high school completion programs will blur, and in the place of an array of separate programs, there will emerge one integrated education and training system within each Service that accepts a wide spectrum of skills in incoming recruits, and systematically educates and trains the recruit in the knowledges and skills that will permit him or her to contribute most profitably to the goals of national defense and personal accomplishment.

TABLE OF CONTENTS

CHAPTER		Page
1	**Basic Skills in Defense**	3
	Basic Skills Education in the Military: The Great Debate	3
	Basic Skills Education in the Military: Issues	4
	Selection and Classification	6
	Basic Skill Levels of Military Applicants and Accessions	10
	Training-Related Basic Skills Issues	13
	Attrition	13
	Trainability	14
	Job Performance and Basic Skills Issues	15
	Discussion	18
2	**Basic Skills Education Programs in the Military: The Past**	21
	Basic Skills Education in Defense: 1940-1960	21
	Basic Skills Education in Defense: 1960-1975	22
	Experimental Basic Skills Programs	24
	The Functional Literacy (FLIT) Project	24
	The FLIT Instructional Program	26
	Integrated Job Skills and Basic Skills Training	27
	Impact of FLIT on Military Basic Skills Programs	28
	Resolving the Great Debate: A Point for Basic Skills Programs	30
3	**Basic Skills Education Programs in the Military: Present and Projected**	31
	Overview of Basic Skills Programs in the Military	31
	Basic Skills Programs for Military Enlistees	33
	Basic Skills Programs in the Four Services	34
	Basic Skills Programs in the Air Force	38
	Basic Skills Education in the Army	40
	Basic Skills Programs in the Marine Corps	42
	Basic Skills Programs in the Navy	44
	Basic Skills Education in the Services: Achievements	46
4	**Basic Skills in Defense: Summary and Conclusions**	51
	Regarding Selection and Classification	51
	Regarding Training	51
	Regarding Job Performance	52
	Regarding Basic Skills Policy	52
	Regarding Basic Skills Programs in the Military	53
	Conclusions	54

Page

REFERENCES 55

FIGURES

1 Citation of Reading and Listening Information Sources by Reading Ability Level 9
2 Reading and Listening Grade Level Equivalents of the AFQT Based on the Literacy Assessment Battery (LAB) 12
3 Percent Discharged by Reading Grade Level for Nonacademic Phase (Early) and Academic Phase (Late) 13
4 Learning of Simple and Complex Military Tasks by High, Middle, and Low Basic Skills (AFQT Groups 16
5 Job Performance in the Marine Corps as a Function of Basic Skill (AFQT-Reading Grade) Level 19
6 Army's Functional Basic Skills Education Program: Knowledge Domains and Skills Supporting MOS (Job) Performance 43

TABLES

1 Arguments Against and for Military Basic Skills Programs 5
2 Reading Materials Used by the General Civilian Work Population and the Navy Work Population 7
3 Personnel (Percent) Reporting Which Written Materials They Write in Performing Their Navy Activities 7
4 Work Day Time Spent in Reading and Writing 8
5 Use of Arithmetic as a Function of Reading Ability 9
6 Reading Grade Level of Military Publications 10
7 Reading Levels of the Young Adult Population 11
8 Reading Levels of Applicants and Accessions for Military Services 11
9 Comparison of Learning by Listening and by Reading for Low and High Skill Readers 14
10 Correlations Between Predictors and Job Proficiency Measures 17
11 Correlations of Reading Grade Level and Skill Qualification Test Scores 18
12 Basic Skills Education Programs in the Military – 1980-1981 32
13 Basic Skills Education in the Military: Programs, Objectives, and Population Served 35
14 Basic Skills Education in the Military: Program Descriptions 36
15 Basic Skills Education Programs in the Military: Program Outcomes 37
16 Armed Forces Basic Skills Program Enrollments and Costs 47
17 Basic Skills Education Program Gains in Reading Grade Levels 47

Basic Skills in Defense

Chapter 1

BASIC SKILLS IN DEFENSE

Throughout the history of the Department of Defense and the four military services, the Air Force, Army, Marine Corps and Navy, there has run a stream of manpower issues concerning undereducated and/or lower aptitude youth who comprise one segment of the young adult population from which the services traditionally draw their new members. Army historians note, for instance, that concerns for the development of basic skills of reading, writing, and arithmetic among soldiers were found in the Revolutionary War when General George Washington ordered chaplains at Valley Forge to teach basic skills to soldiers; during the Civil War, both the United States and the Confederate Armies included significant numbers of illiterates, running to 40 percent in some regiments (Weinert, 1979).

In the Navy, too, the lot of teaching basic skills to Navy enlisted men fell to the chaplains. A Navy regulation of 1802 includes among the chaplain's duties the following:

> He shall perform the duty of a school-master; and to that end he shall instruct the midshipment and volunteers, in writing, arithmetic, and navigation, and in whatsoever may contribute to render them proficients. (Fletcher, 1976, p. 69)

Today, some two hundred years since the Revolutionary War, the teaching of basic skills to military personnel is still an ongoing activity in the Army and Navy, and basic skills programs are now to be found in the Air Force and Marine Corps as well. In fact, data reported later in this report indicate that, during fiscal year 1981, basic skills education in the four Services involved more than 200,000 course enrollments with combined contract and student salary costs in excess of $70 million.

BASIC SKILLS EDUCATION IN THE MILITARY: THE GREAT DEBATE

Basic skills education, whether for children or adults, seems to foster a variety of positions that are intensely debated in public and in private, and in the scientific, popular, and political arenas. One of these "great debates"—whether the teaching of reading is best done by the phonics or whole word approach—was documented and thoughtfully analyzed by Professor Jeanne Chall in her now classic volume, *Learning to Read - The Great Debate* (1967).

With regard to national defense, the great debate about the basic skills centers around whether or not the teaching of basic skills to young adults is a proper function of the armed services. Thirty years ago, Ginzberg and Bray (1953) presented the prevailing point of view among senior Army staff that "Education is not a primary function of the Armed Forces. Armies in democratically organized nations with an industrial economy must utilize in an emergency, personnel with a general education level which civilian educational systems have produced." (p. 210)

In 1977, the Congress of the United States reaffirmed the position of the Army senior staff of the early fifties when both houses expressed ". . . considerable concern over the implications of attempting to correct educational deficiencies (of military personnel) with programs that require school attendance during duty hours . . . (The Congress went on to express the belief that) ". . . more effective use of these (education) monies would result from programs that emphasize basic educational skills prior to enlistment." (Congressional Record, August 4, 1977, PH8742).

A representative sample of the major arguments in the great debate are summarized in Table 1. The arguments against the teaching of basic skills in the military focus on (1) avoiding the problem by pointing to the undesirable performance consequences of permitting the less literate to enter military service; (2) the problems and costs of training the less literate; (3) the use of limited assignments in lieu of basic skills training; and (4) the ineffectiveness of basic skills programs in improving either basic skills or job training and performance. Though, for the most part, the more recent arguments against basic skills education in the armed services are consistent with those offered thirty years ago, two arguments update the debate; the Army's Training and Doctrine Command (TRADOC) argues that (1) the modern Army is more technologically complex than that of World War II, and hence greater demands for literacy exist,[1] and (2) the problem of illiteracy is different today than in World War II because today most applicants for service have had opportunities for schooling and have failed, whereas in World War II the undereducated had not experienced failure in school—they simply had little education.

The arguments for the teaching of basic skills in the armed forces counter those against such training by submitting that (1) many less literate personnel perform as well as more highly literate personnel and screening instruments are not accurate enough to distinguish the potentially adequate from the inadequate; (2) avoiding the marginally literate in peace time prevents the acquisition of leadership and training experience in training such personnel when mobilization requires their use; (3) literacy training and job skills training can be cost-effectively modified to improve the proficiency of the undereducated; and (4) demographics of the available manpower pool indicate the use of a significant number of marginally literate personnel. Another factor influencing the argument for basic skills education in the military that was not a consideration in World WAR II is affirmative action. Because low literacy is a major factor among minority groups, there is concern that education, training, medical, and job experience benefits of military service not be disproportionately denied to members of minority groups whose education and language background may retard their performance on military selection and classification instruments, even though their job performance may be adequate (Vineberg and Taylor, 1972). In such cases, it is argued, basic skills education may be useful in preparing minority personnel to meet the knowledge and skills requirements for technical skills training and supervisory and leadership positions.

BASIC SKILLS EDUCATION IN THE MILITARY: ISSUES

The arguments for and against basic skills education in the military touch upon a variety of concerns which are discussed here in terms of issues broadly related to selection and classification, training, and job performance.

[1] In June 1980 issue of *Army* magazine it is reported that according to General Starry, then Commander of the Army's TRADOC, the amount of formal training in job technical skills has had to be cut to accommodate smaller training budgets and slower reading speeds.

Table 1

Arguments Against and for Military Basic Skills Programs

Against	Against	For	For
(From Ginsberg & Bray, 1953, pp. 209-211)	11. Few poorly educated would acquire more than minimum literacy and would therefore be unable to serve as cadremen.	(From Ginsberg & Bray, 1953, pp. 213-221)	9. Coupled with the prediction of declining numbers are reports that academic skills have declined in the available pool.
1. It takes a long time to train illiterates.	12. Educationally marginal people will have limited value in the reserves.	1. Many thousands of illiterates do meet training and job performance standards.	10. Job-oriented literacy programs have been successful to some degree in preparing personnel for military jobs, and this approach can be extended.
2. It is difficult and expensive to develop training programs that do not depend on the use of printed material.	(From OASD(MRA&L), 1980)	2. Special training time/costs could be recovered by an extention to the length-of-service requirement.	(From DoD Directive 1322.8, 1980)
3. Administration is hampered by personnel who can not fill out forms, pay receipts, etc.	13. Non-high school graduates have a first-term attrition rate twice that of high school diploma graduates.	3. Some jobs may be best suited to less literate personnel than to higher educated whose skills could be better used.	11. Military Service members, as citizens in uniform, should share the same opportunities for education that are provided for all eligible citizens.
4. Serious accidents can be traced directly to the inability of men to read warnings and study safety instructions.	(From Sacher and Duffy, 1977)	4. There is no positive correlation between the amount of education achieved and willingness and competence to serve as a fighting man.	(From Larson, 1979)
5. Serious social barriers exist between literate and illiterate personnel.	14. Poor readers have a high discharge rate during the academic phase of Navy recruit training.	5. Rejecting undereducated during peace time and then accepting them during mobilization presents problems of rapid accommodation to less literate.	12. Occupational literacy requirements are often artificially inflated in job training by unnecessary reading assignments and written testing.
6. Literates tend to resent the long oral directions given for the sake of illiterates.	(From Training and Doctrine Command, 1980)	6. The Armed Forces Qualification Test (AFQT) cannot evaluate the literacy of persons who have no knowledge of English or the intelligence of a person who cannot read or write English.	13. Superfluous literacy requirements of military training programs can be reduced through the use of self-paced training methods, audio-visual training devices, hands-on training performance-oriented testing.
7. Large numbers of disciplinary problems are caused by inability to read station orders, liberty regulations, etc.	15. The modern Army is more technologically complex than in WW II and less literate recruits cannot learn as much as needed in designated time.	7. Peacetime should be used for research to gain experience and technical competence in dealing with undereducated.	(From Sticht, 1979)
8. Inability to read and write constitutes a serious morale problem and obstacle to satisfactory adjustment to military life.	16. Short intensive remedial literacy programs are not effective; skills gained are not retained.	(From Harding, et al., 1981)	14. Research is reported to suggest that it is possible to integrate job skills and basic skills training into the same training day without adding to the overall training time.
9. Relatively untrainable manpower is optimally utilized by "limited assignments".	17. Unlike in WWII and Viet-Nam, current problem is not providing education for the uneducated, but salvaging the failure of the public schools.	8. Manpower projections are that the pool from which the Navy (and DoD) draws will shrink in the 1980s and 1990s making it likely that more recruits must be taken from the undereducated.	
10. Training in basic skills requires increased instructor personnel; additional outlays for facilities; reduction in effective duty due to prolonged training time for the poorly educated.			

Selection and Classification

The selection and classification procedures of the Department of Defense are aimed at meeting the Service's personnel strength goals in a cost-effective manner. This means, among other things, that selection and classification procedures must operate to screen out those individuals whose basic skills are so low as to render them untrainable, or trainable only with great expense, or, conversely, to select those whose basic skills meet the demands for such skills in the Services. To do this, the selection and classification system, working hand-in-hand with the recruitment system, must permit the military to recruit an adequate number of new members each year whose basic skill levels meet the basic skill levels demanded by military jobs and functions.

Given an all volunteer military, the extent to which service personnel requirements can be met depends upon (1) the basic skills demands of military jobs, and (2) the basic skill levels of new accessions. The latter depends, in turn, upon the basic skill levels in the youth population from which the Armed Services draw new members, and further, upon the basic skill levels of those youth who actually apply for Military Service.

In this section, information is presented that addresses the questions: What are the demands for basic skills in the armed services? What are the basic skill levels of the youth population from which new military accessions are drawn? What are the basic skill levels of applicants for military service, and what are the basic skill levels of those who actually enlist in the military?

Demands for Basic Skills: Two approaches to identifying basic skills demands in the military are discussed here. One involves the identification of reading and writing tasks in the Navy and the use of listening, reading, and arithmetic skills in the Army, the second involves the use of readability formulas to estimate the general reading demands of publications in the Army, Navy, and Air Force.

(1) Identification of basic skills demands through interviews. In work for the Navy (Sticht, Fox, Hauke, and Zapf, 1976), interviews were conducted with students and instructors in basic military training, in ten Navy job (rating) training programs, and with job incumbents who worked in the same ten ratings. The interviews identified what kinds of materials Navy personnel read, what they write, and how much time they spent reading and writing. Table 2 presents the types of materials Navy personnel reported reading and compares the Navy data to similar data from research in civilian job settings. Taken at face value, the Navy appears to have a broader demand for reading than is found in a representative civilian work force.

Table 3 shows the kinds of materials Navy personnel reported writing (composing, originating; not just copying). The major category of "Other" for instructors included mostly classroom "chalk-talks", while for students the "Other" category most often referred to taking classroom notes.

A third question asked the Navy personnel to estimate how much time they spent reading and writing each work day. Table 4 indicates that job incumbents, instructors, and students spend anywhere from less than one to more than four hours a day in these literacy tasks. Averaged over the three groups, for two hours a day Navy personnel read, while slightly over one hour a day is spent writing. Research in some two dozen different jobs by Mikulecky and Diehl (1980) used a similar interview technique and found an overall average of around 1.9 hours per day reported in reading. Thus, the Navy and civilian data are comparable in showing considerable demands for literacy at work.[1]

[1] More recent work by Mikulecky and Diehl, using a larger sample of civilian jobs and including direct observation of reading on the job, suggest that self-report figures may underestimate the amount of time spent reading by as much as 50% (Mikulecky, January 1982, personal communications).

Table 2

Reading Materials Used by the General Civilian Work Population and the Navy Work Population

Reading Materials	Civilian Work Population (%)	Navy Work Population (%)
Signs/Schedules/Notices	43-57	94-99
Forms/Logs/Invoices/ Accounting Statements	39-44	72-91
Letters/Memos/Notes	48	47-78
Manuals – Written Instruction/Directions	42	88-93
Legal Documents (Navy Regulations)[1]	14	68
Reports/Articles in Publications (Correspondence Courses)[1]	34	51

[1] Materials in parentheses are judged to be the Navy equivalent of the corresponding civilian materials.

Table 3

Personnel (Percent) Reporting Which Written Materials They Write in Performing Their Navy Activities

Written Materials	Personnel			Total (%)
	Job Performers (%)	Instructors (%)	Students (%)	
Forms	88	97	90	90
Logs	69	72	58	66
Figures	56	78	47	57
Memos	54	62	28	45
Schedules	49	66	18	40
Reports	44	62	16	36
Directions	40	66	19	37
Notices	32	48	12	27
Letters	27	22	12	20
Orders	23	34	6	19
Messages	21	3	6	12
Official Notes	18	17	4	13
Other	13	50	72	42
N	78	32	68	178

Table 4

Work Day Time Spent in Reading and Writing

Reading (%)				Writing (%)		
Job	Inst.	Student	Hours Spent Daily	Job	Inst.	Student
27	16	14	< 1.0	54	34	19
27	31	32	1.0 - 1.9	22	25	14
18	22	14	2.0 - 2.9	15	22	27
12	9	17	3.0 - 3.9	4	9	14
17	22	23	4.0+	5	9	27
—	—	—		—	—	—
78	32	66	N	78	32	64

In a second study for the Army (Sticht, Caylor, Kern and Fox, 1971), Army personnel working as Cooks, Mechanics, and Supply Specialists were interviewed at their job sites to identify listening, reading, and arithmetic tasks that they perform. Army personnel were asked to cite five instances of tasks that they had worked on in the last month or so in which they had (1) asked somebody for information and listened to the reply, (2) read some material to find information, and (3) performed some arithmetic. Five citations were sought for each use of basic skills. Altogether, 48 Cooks, 85 Mechanics, and 30 Supply Specialists were interviewed.

Figure 1 shows the data for listening and reading for these personnel sorted into three different reading skill levels, expressed in reading grade levels. The figure indicates that the Cooks reported a high percentage of reading tasks, but very few listening tasks. For Mechanics and Supply Specialists, the percentage of reading citations increased as a function of reading level. For the poorest readers, there was a slight tendency for them to ask for (listen to) information more than to consult written sources.

Regarding the use of arithmetic, Table 5 presents the percent of arithmetic citations, out of five possible, for three reading skill levels. The data show that Mechanics gave the least citations, while Cooks and Supply Specialists provided about the same level of arithmetic use, with little differences for the three reading skill groups. For Cooks and Supply Specialists, greatest use of arithmetic was with whole numbers and systems of measures, while Mechanics reported the use of measurement tools.

Together, the Navy and Army research indicate that considerable demands for basic skills of listening, reading, writing, and arithmetic exist in the armed services, even in military jobs with high density for lower aptitude personnel (for related research in the Navy see Sachar and Baker, 1981; in the Air Force see Burkett and Hooke, 1979).

(2) Identification of basic skills demands using readability formulas. All Services have evaluated the reading demands of technical manuals and regulations that they produce using special formulas that estimate the reading grade level of difficulty of materials (Mockovak, 1974; Sticht and Zapf, 1975; Curran, 1980). Table 6 presents reading grade levels of publications in five jobs from the Air Force, Army, and Navy. These jobs are representative of the types of work military personnel are assigned in the Services.

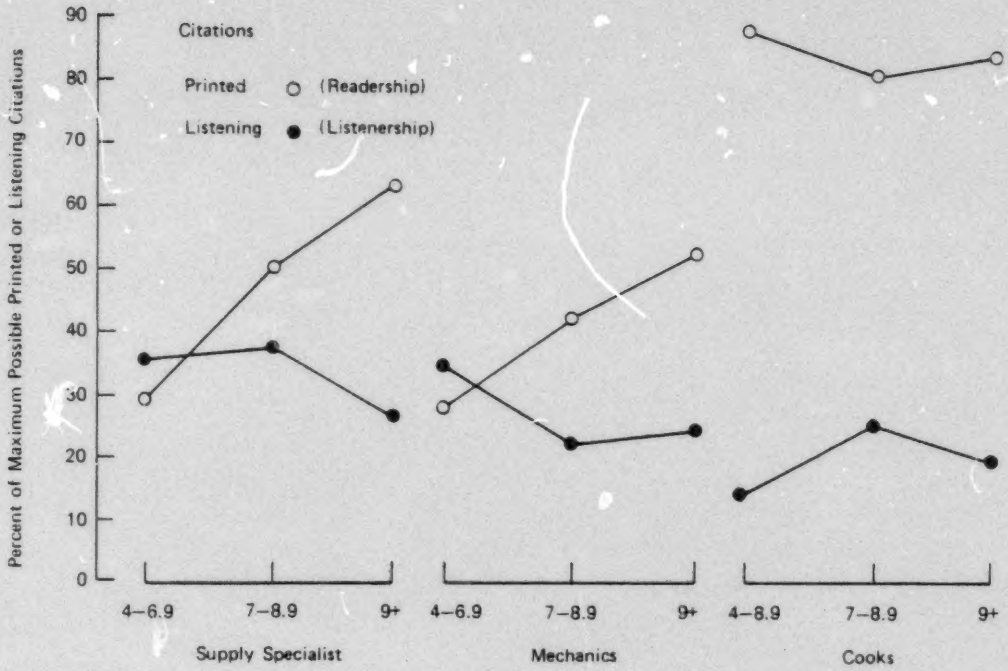


Figure 1. **Citation of Reading and Listening Information Sources by Reading Ability Level**

Table 5

Use of Arithmetic as a Function of Reading Ability

(Use of Arithmetic is in Percent of Maximum Citations Possible)

Job	Reading Level	Arithmetic Citations (Percent)	Percent of Citations Using: Whole Numbers	Decimal/ Fractions	System of Measure	Measurement Tool[a]
Repairman	9+	15	5	5	27	63
	7 - 8.9	6	9	0	27	64
	4 - 6.9	9	8	0	0	92
Supply Specialist	9+	38	32	9	54	5
	7 - 8.9	33	73	0	27	0
	4 - 6.9	28	71	0	29	0
Cook	9+	32	33	0	63	4
	7 - 8.9	29	35	0	65	0
	4 - 6.9	33	29	0	68	3

[a] Ruler, gauge.

Across the Services, reading levels of materials average in the 10-13 grade level range which, as indicated below, far exceeds the reading skill levels of much of the young population from which the military recruits, as well as the skill levels of those actually enlisted.

Table 6

Reading Grade Level of Military Publications

Air Force[a]		Army[b]		Navy[c]	
Job	RGL	Job	RGL	Job	RGL
Nuclear Weapons Specialist	10.7	Medical Specialist	10.6	Torpedoman	10.3
Maintenance Electronics	11.0	Infantryman	10.8	Quartermaster	10.9
Precision Measurement Specialist	11.1	Vehicle Rapairman	11.3	Engineer	11.2
Weapons Mechanic	11.4	Military Policeman	11.6	Radioman	12.6
Inventory Management	11.4	Personnel Specialist	12.5+	Personnelman	13.2

[a]Mockovak, 1974.
[b]Sticht, 1975, p. 112.
[c]Duffy & Nugent, 1978, pp. 12-15.

Reading Levels of the Young Adult Population: To obtain personnel with basic skills suitable to meet the demands for such skills in the military, the Department of Defense recruits primarily from the young adult population aged 17 to 23. In a recent study for the Department of Defense,[1] a representative sample of youth in this age range was administered the new Armed Services Vocational Aptitude Battery (ASVAB), form 8A. A conversion formula for transforming the G (General) composite of the ASVAB into reading grade levels as measured by the Adult Basic Learning Exam (ABLE) was applied.

Table 7 presents the estimated reading grade levels of the youth population. The median reading grade level is 9.6 (sixth month of the ninth grade). Some 4.5 million (18%) youth read below the 7th grade level, while about 8.5 million (33%) read above the 11th grade level.

Basic Skill Levels of Military Applicants and Accessions

Reading grade levels of applicants for and accessions into military service for fiscal year 1981 were determined using Defense Manpower Data Center (DMDC) files. Table 8 presents these data. The reading grade levels for the table were obtained by transforming Armed Forces Qualification Test (AFQT) percentile scores into reading grade levels on the Test of Adult Basic Education (TABE) using conversion tables reported by the Army (Army Continuing Education System, 1981). The median of 8.6 contrasts with a median of 9.6 for the youth population, indicating that applicants for military service tend to come disproportionately from the ranks of the less literate.

[1] Appreciation is expressed to DMDC staff, Dr. Brian Waters and Mrs. Janice Laurence of HumRRO, for making available the fiscal year 1981 data on applicants and accessions for military service.

Table 7

Reading Levels of the Young Adult Population

Reading Grade Level[a]	Youth Population[b]		
	Number	Percent	Cum. Percent
3.0 - 4.9	1,222,196	4.8	4.8
5.0 - 5.9	1,276,924	5.0	9.8
6.0 - 6.9	2,010,967	7.9	17.7
7.0 - 7.9	2,682,034	10.6	28.3
8.0 - 8.9	3,333,267	13.1	41.4
9.0-9.9	2,766,213	10.9	52.3
10.0 - 10.9	3,542,121	13.9	66.3
11.0 - 11.9	4,105,026	16.2	82.4
12.0 - 12.9	4,470,047	17.6	100.0
Total:	25,408,795	100	100
Mean RGL: 9.4	Median RGL: 9.6		SD: 2.4

[a]Reading Grade Levels were estimated for the profile study sample using conversion tables for ASVAB G scores to ABLE reading test scores. The correlation between the scales in the test equating sample was .85.

[b]Restricted to persons in the sample born between January 1, 1957 and December 31, 1962 (18 through 23 years at time of testing, July-October 1980.

Table 8

Reading Levels of Applicants and Accessions for Military Services

(Fiscal Year 1981)

Reading Grade Level[a]	A Applicants			B Accessions		
	Number	Percent	Cum. Percent	Number	Percent	Cum. Percent
3.0 - 4.9	54,690	6.0	6.0	22	0.0	0.0
5.0 - 6.9	161,983	17.7	23.7	18,006	5.6	5.6
7.0 - 8.9	282,257	30.9	54.6	107,610	33.3	38.9
9.0 - 10.9	228,803	25.1	79.7	111,415	34.4	73.3
11.0 - 12.9	185,122	20.3	100.0	86,349	26.7	100.0
Total:	912,855			323,402		
Median RGL: 8.6				9.5		

[a]Reading Grade Level scores are Test of Adult Basic Education (TABE) scores estimated from Armed Forces Test (AFQT) percentile scores using conversion tables from a study by OASD(MRA&L) and reported by the Army Continuing Education System, 28 October 1981, pp. 19-20.

However, data for military accessions show a median reading level of 9.5, very close to the level of the available youth population. Further, the accessioned sample contains only 5.6 percent reading below the 7.0 grade level, in contrast to 18% reading below the 7.0 level in the youth population. Thus, the armed services are actually attracting and enlisting a force whose literacy skills are higher than those of the general youth population in which the Services recruit.

In 1981, Mathews, Valentine, and Sellman (1978) administered the Literacy Assessment Battery (LAB), an experimental assessment battery that measures both listening and reading comprehension scores. Figure 2 shows the results for some 2,000 applicants on the LAB Paragraphs subtest (Sticht, Hooke, and Caylor, 1981). In this subtest, two

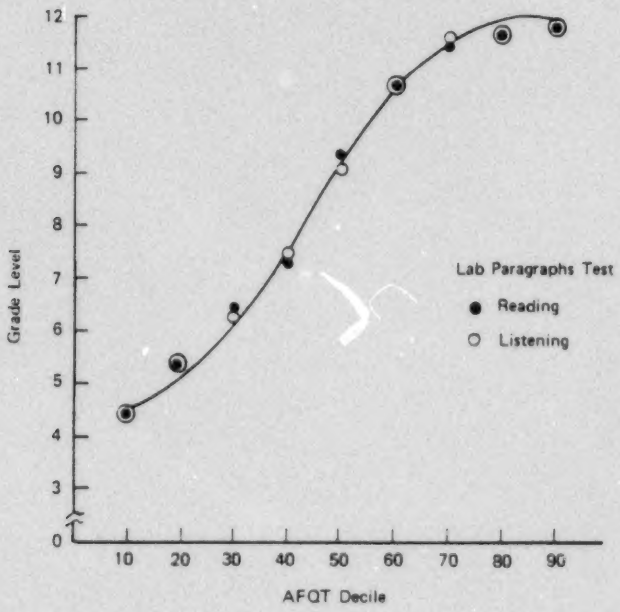


Figure 2. **Reading and Listening Grade Level Equivalents of the AFQT Based on the Literacy Assessment Battery (LAB).**

paragraphs are listened to and orally administered questions are answered, and two comparable paragraphs are read and then written questions are answered. The important point is that both listening and reading are highly related to AFQT and, significantly, listening and reading scores, expressed in grade levels, are almost identical. This indicates that poor readers are also likely to be poor listeners. Thus, literacy problems in the lower levels of the AFQT are likely to represent low levels in both language comprehension and decoding skills. Such problems are resistant to brief remedial efforts that focus primarily on the teaching of reading decoding skills, because extensive vocabulary and conceptual knowledge must be developed to permit improved comprehension.

TRAINING-RELATED BASIC SKILLS ISSUES

Attrition

Selection and classification procedures are used to reduce the costs associated with enlisting people who subsequently attrite or who require an extended period of time or special methods for learning job technical skills. This section reviews research on the relationships of basic skills (primarily reading) to attrition and trainability.

The best demonstration found of the relationships among reading and attrition from the training base comes from Sachar and Duffy (1977). These researchers examined the attrition of some 26,032 Navy recruits from basic military training during either the academic or non-academic phases of training. Figure 3 shows that attrition for poorer readers was much higher during the academic phase than the non-academic phase. This is consistent with the fact that in the Navy, the academic phase of basic military training involves extensive reading and paper-and-pencil test-taking.

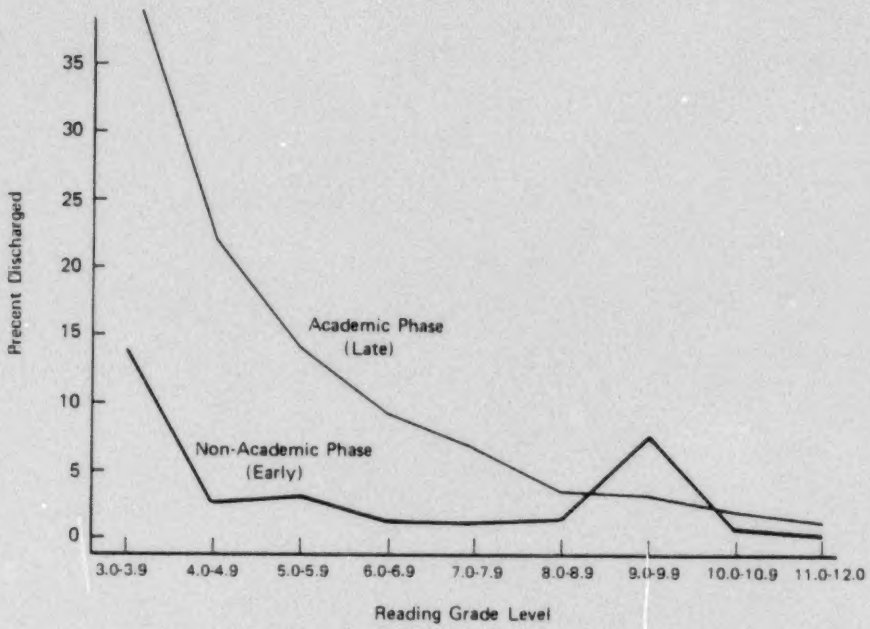


Figure 3. **Percent Discharged by Reading Grade Level for Nonacademic Phase (Early) and Academic Phase (Late). (Sachar & Duffy, 1977)**

In an Army study, the Training and Doctrine Command (TRADOC) (February 1980) reported that from 1 October 1978 to 30 November 1979, of 4,142 enlistees reading below the 5th grade level, 21.5% were discharged during initial entry training, a rate of attrition 2 1/2 times the rate of those scoring at or above the 5th grade level.

Trainability

One problem frequently cited with respect to the training of poor readers is that, because of their poor reading skills they are slow to learn and require oral instruction (see Table 1). In a series of studies, Sticht (1972) explored the effects of removing reading requirements of training by substituting oral instruction, as suggested in Table 1, so that learning by listening could be evaluated. Table 9 shows the results of one study that compared learning by listening versus reading using Army personnel having an average RGL of 6th grade (low reading ability group) or 10th grade (high reading ability group) as estimated from AFQT scores. It is clear that removing the requirement for reading does not permit the poorer readers to learn by listening as well as the better readers learn by reading. In short, the differences between good and poor readers is not solely one of processing written language. In fact, the poor readers do not listen as well as the better readers. Thus, as noted earlier, learning by language, not just by reading, is a problem for the poor readers.

Table 9

Comparison of Learning by Listening and by Reading for Low and High Skill Readers

Reading Group	Average Grade Level of Material					
	6.5		7.5		14.5	
	Listen	Read	Listen	Read	Listen	Read
Low (RGL 6) (N=40)						
Mean	52.87	51.68	52.46	42.98	25.48	26.02
SD	19.96	27.39	16.25	19.48	13.43	17.83
High (RGL 10) (N=56)						
Mean	72.25	72.46	69.54	65.18	44.89	48.72
SD	19.93	21.04	15.88	18.45	19.76	20.63

Further indication of training differences among high and low reading groups comes from work by Fox, Taylor, and Caylor (1969). Working with Army personnel in three AFQT groups: high—90-99, middle—45-55, and low—10-21 percentile, a variety of Army tasks were trained with one-on-one instruction using a combination of video tape accompanied by a live instructor, step-by-step demonstration of procedural tasks, verbal prompts and checklists to permit learning by say-and-tell-and-do.

The Gray Oral Reading Test was administered to establish reading levels of the three groups. These RGLs were: high—12-13; middle—11-12; low: range from 0 to 11, with over half reading below the 5th grade level.[1] Thus, these data indicate that there is

[1] Some 10% of the lower aptitude group read at the 11th grade level. This may reflect the fact that these data were obtained while the draft was in effect, and some may have purposely scored low on the AFQT to avoid service, but once drafted, they performed well on other cognitive tasks.

considerable variation among the lowest scoring population. Imprecision and unreliability of measurement among the lowest levels of AFQT and reading make selection and classification a particularly difficult task for this group.

Overall, however, the results of the individually administered Gray Oral Reading Test confirms the findings of group administered reading tests in indicating that, whatever else the AFQT might assess, it is consistently sensitive to reading (and, as we saw above, oral language) comprehension differences in the population.

The training data obtained for these three aptitude/reading level groups were obtained using Army tasks ranging from simple to complex. The simplest task involved learning how to assemble a rifle, a basic task for all soldiers. A task of moderate complexity involved learning the series of steps needed to prepare a missile for launching, and the most complex task involved learning the concepts of range and bearing and using this knowledge to plot locations of targets on a grid.

Figures 4a, b, and c show the number of trials provided in the individualized instruction to teach these Army tasks. The figures present cumulative percentages of trainees in three reading level (AFQT) groups who achieved criteria per each trial. Across all tasks, the differences between the highest and lowest group are widespread, and the middle group occupies the middle ground. The data indicate that rate of learning in the least capable group is much slower than for the middle and high groups, though some, and in some instances many, of the least able achieve at rates comparable to those in the middle and high groups.

The spread of the lowest group over trials is generally much greater than for the higher group reflecting the variability in the low groups as mentioned above. This is particularly true in Task C, the most complex task involving symbolic, conceptual learning. Here, the differences between the highest and lowest groups are exceptional, and the variability within the lowest group is at its greatest, with 45 percent reaching mastery at the end of three trials, which was the number of trials required for 100 percent of the highest ability groups to master the task, and yet 25 percent of the least able never achieved criterion.

Combined with the research on listening and reading, these findings from the experimental study of learning, by a variety of individualized instructional techniques, indicate that many persons low in basic skills, as estimated from the AFQT, appear to have learning difficulties that go well beyond a lack merely in the skills of reading, writing, and arithmetic, that are typically taught in remedial basic skills programs.

JOB PERFORMANCE AND BASIC SKILLS ISSUES

Relationships among basic skills (reading, listening, arithmetic, and AFQT) and job performance (job knowledge tests, job hands-on performance tests and supervisor ratings) in the Army have been reported (Sticht, 1975; Miller, Nystrom, and Hicks, 1980).

Table 10 shows correlations of basic skills tests with job knowledge (paper-and-pencil tests), hands-on, job sample tests, in which cooks cooked, vehicle repairmen repaired vehicles, etc., and supervisor ratings of job performance. Some 400 active duty personnel are included in the data for each job. The data show that the AFQT and other basic skills tests correlate to about the same degree with each indicator of job proficiency. Further, if the job proficiency measure is a paper-and-pencil test, like the basic skills tests, the correlations are higher than for the hands-on test (job knowledge versus job performance data). Supervisor's ratings, which do not involve direct assessment of personnel as do the job knowledge, job performance, and basic skills tests, are not highly correlated with the latter tests.

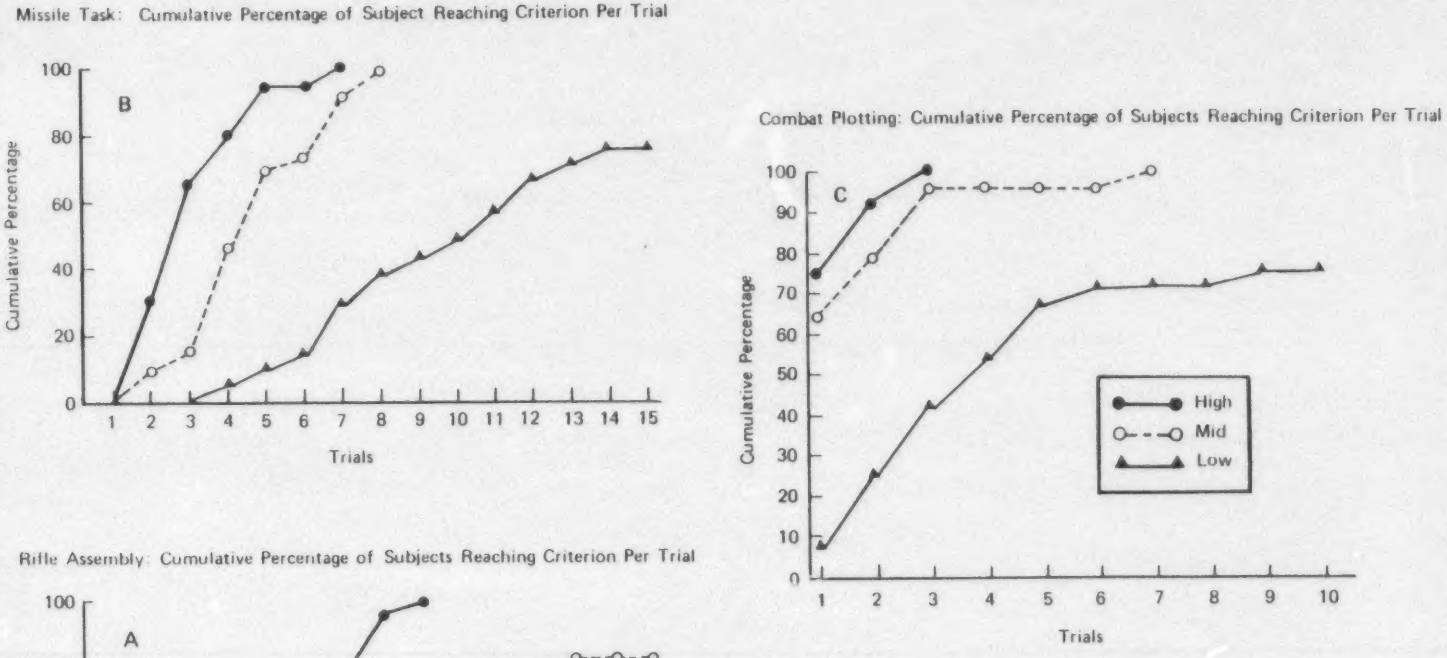


Figure 4. **Learning of Simple and Complex Military Tasks by High, Middle, and Low Basic Skills (AFQT) Groups.**

Table 10

Correlations Between Predictors and Job Proficiency Measures

Job	Predictor	Job Proficiency Index		
		Job Knowledge	Job Performance	Supervisor Ratings
Armor Crewman	AFQT	.55	.37	.07
	Reading	.57	.32	.06
	Arithmetic	.49	.31	.14
	Listening	.53	.29	.06
Repairman	AFQT	.44	.32	.16
	Reading	.47	.26	.17
	Arithmetic	.39	.24	.14
	Listening	.40	.38	.09
Supply Specialist	AFQT	.36	.37	.15
	Reading	.40	.40	.10
	Arithmetic	.34	.36	.09
	Listening	.35	.42	.11
Cook	AFQT	.49	.37	.15
	Reading	.56	.34	.11
	Arithmetic	.44	.31	.13
	Listening	.39	.28	.07
Average Overall Jobs/Basic Skills Tests		.45	.33	.11

Table 11 presents Army data relating reading grade level to performance on Skill Qualification Tests which are in operational use to assess job proficiency (Miller, Nystrom, and Hicks, 1980). These measures were based on the same principles as the earlier developed job knowledge and job performance tests of Table 10. The Skill Qualification Test has a written test component (job knowledge) and a hands-on, performance component (job performance). The data show a comparable pattern to those of Table 10, with highest correlations between the reading and job knowledge tests, and shrinkage of the correlation between the reading and hands-on performance test (similar data for eight Army jobs are reported by Wagner, Dirmeyer, Means, and Davidson, 1982). Spanning the decade from 1970 to 1980, the relationships between basic skills and job proficiency remain positive and remarkably constant across these two studies, with the range of the variance in job knowledge predicted from one of the basic skills tests extending from 12% to 32%, and from 3% to 26% for the hands-on performance tests. Though these data do confirm that basic skills are positively related to job performance, it is clear that this relationship is far from perfect. In fact, using a subset of the data from Table 10, Vineberg and Taylor (1972) found that for the lowest level performers on the AFQT, with percentile scores in the 0-20 range, 33% scored above the hands-on test median for all members of the sample who had been on the job for 1 to 18 months.

Table 11

Correlations of Reading Grade Level and Skill Qualification Test Scores

Job Infantry (MOS)	Job Proficiency Index	
	Job Knowledge (SQT: Written)	Job Performance (SQT: Hands-On)
11B	.49	.18
11C	.52	.19
11E	.48	.51
All	.43	.24

(After Miller, Nystrom & Hicks, 1980)

Similarly, 25% of the highest scorers on the AFQT scored below the median on the hands-on performance test. Thus, many of the least competent in the basic skills became above average job performers, while many highly skilled in the basic skills perform job tasks in a below average manner.

Marine Corps data (Hiatt and Sims, 1980) showing relationships of AFQT—Reading levels to successful performance are shown in Figure 5. These data are for 17,684 Marine Corps recruits who enlisted between 1 January 1976 and 31 August 1976. At the time of data analysis the recruits had had time to complete their enlistment. There is a clear trend for the least proficient in basic skills to have a lower joint probability of completing the first term and being promoted to corporal in the Marine Corps. Also, there are considerable differences between high school graduates and nongraduates across the range of basic skill (AFQT) levels. It is notable that the lowest skill level (AFQT category IV, B, C) high school graduates have the same probability of success as the highest skill level (AFQT categories I, II) non-high school graduates. This suggests that, as with the Army data discussed above, skill level per se is not the overriding determinant of success in the Marine Corps. This is also suggested by the gap between the highest level non-high school graduates and the high school graduates. That gap amounts to a 25% spread, which is the same as the spread between the highest and lowest skilled high school graduates.

DISCUSSION

The review of issues relating to basic skills education in the military confirms the arguments of both sides of the great debate. Issues relating to selection and classification were examined and it was found that:

- The military services pose demands for basic skills equal to or greater than those of comparable civilian jobs.

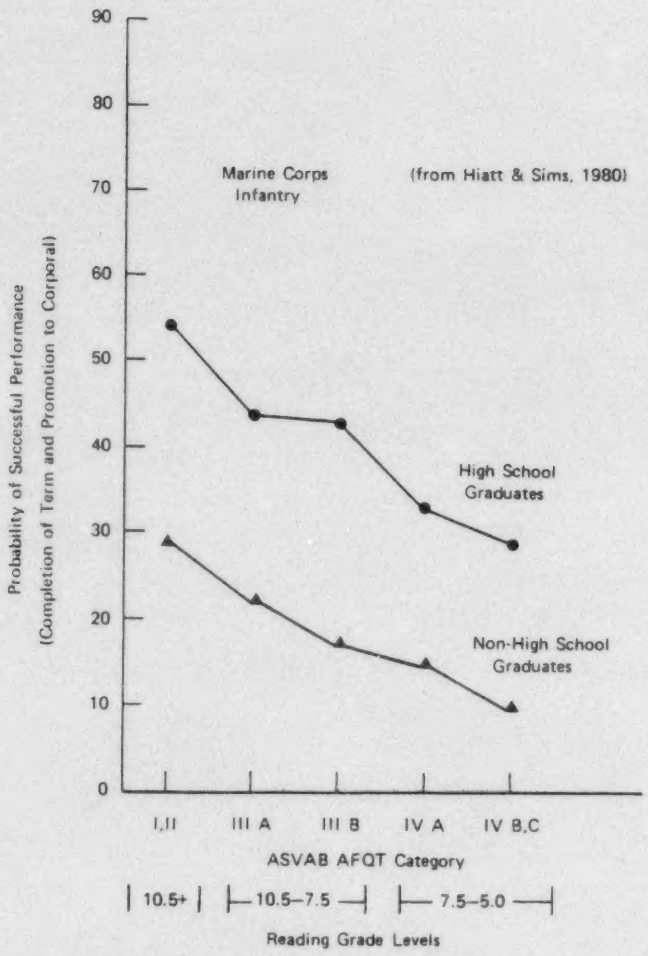


Figure 5. **Job Performance in the Marine Corps as a Function of Basic Skill (AFQT-Reading Grade) Level.**

- Reading levels of military accessions exceed those of the young population from which the military recruits
- However, as in the civilian population, many military recruits are low in basic skills, including listening skills. Oral language comprehension, and not just reading is a problem for the least able enlistees.

Basic skills issues related to training were examined and it was found that:

- Attrition rates are highest for those lowest in basic skills. Yet most of the latter do not attrite.
- Attrition rate is more highly related to the demands for basic skills use during "academic" as contrasted with "performance" phases of training. Yet the majority of the least capable do not attrite from either phase of training.

- Removing reading demands of training by substituting listening or one-on-one, audio-visually supported live instruction did not remove learning differences between trainees high or low in basic skills. Yet many of the least skilled learned as well as the most skilled on a variety of military tasks.

Regarding job performance and basic skills, it was found that:

- AFQT, reading, listening, and arithmetic skills are positively correlated with paper-and-pencil job knowledge tests and hands-on job sample tests such as used in the Army's Skill Qualification Testing program. Yet many of the least skilled were in the top half of job performance, while many of the highest skilled were in the bottom half of performers on hands-on tests.
- The most highly skilled non-high school graduates in a Marine Corps study had a job success rate equal to the lowest skill levels (AFQT below the 20th percentile) for high school graduates. Thus basic skills competence, per se, does not appear to be the overriding determinant of success in the Marine Corps.

While the review of issues in this chapter is not exhaustive, the studies cited nonetheless reveal why the great debate continues. Both those for and against the teaching of basic skills in the military can cite the same studies to support their positions. However, one of the issues regarding the teaching of basic skills in the military has not yet been examined. This is the issue of the extent to which basic skills teaching can be effectively accomplished in the military. Because this is a key concern for this report, it is addressed separately in Chapters 2 and 3.

Chapter 2

BASIC SKILLS EDUCATION PROGRAMS IN THE MILITARY: THE PAST

This chapter presents a brief review of basic skills programs conducted by the armed services since World War II and through the mid-seventies. Because several reports document the World War II programs and programs operating in the 1950's, 60's and 70's, this review of those programs will be very brief. Readers desiring further information should consult the reports that are cited in the discussion of those past programs.

The latter part of this chapter presents a more extensive review of research to develop job-oriented basic skills programs in the Army, Air Force, and Navy in the 1970's. The research on these experimental programs produced concepts and methods which undergird many of the current and planned basic skills programs in the military that are discussed in Chapter 3.

BASIC SKILLS EDUCATION IN DEFENSE: 1940-1960

The major precursor to present literacy training programs was the large scale training of functional illiterates in the Armed Forces during World War II. Figures reported by Goldberg (1951) in his extensive review of Army training of illiterates in World War II indicate that, subsequent to June 1, 1943, some 302,838 men received literacy training. Of these, 254,272 were graduated because of successful attainment of required standards, which were designated as literacy skills as possessed by the completion of the fourth grade of school (i.e., grade level 5.0).

Such successful performance during World War II is frequently cited by reading experts (Robinson, 1966) as an example of an approach for upgrading the literacy skills of adults to render them better, more competent, job performers. However, evaluation of the effects of literacy training on job proficiency was almost non-existent, and such evaluation as was attempted was fraught with methodological difficulties. One attempt at an assessment of the effects of literacy training upon job proficiency was made by Hagen and Thorndike (1953). In this research illiterates who entered the Navy during 1944 and who received literacy training at Camp Perry were compared to literate men from the same parts of the country who entered at the same time; the illiterates were also compared with marginal aptitude men who did not receive literacy training. Although several methodological limitations restrict the conclusions of this study,[1] it was found that the illiterates who received literacy training were subsequently characterized by fewer promotions, lower proficiency ratings, more disciplinary actions, more lost time due to misconduct, fewer honorable discharges, and more VD than the controls. Thus, in this case, literacy training did not produce men comparable in job proficiency to marginal aptitude men who did not receive such training, nor to normal aptitude men.

[1] For instance, as reported by Hagen and Thorndike, the literate group contained only draftees, no enlistees; the marginal aptitude group was superior in literacy, general intellectual ability, and education level to the illiterate group; the marginal aptitude group differed in age and background from the illiterate groups; and in many cases records were incomplete and inconsistent.

During the 1950's, the Armed Services had additional opportunities to conduct literacy training, and to evaluate the effectiveness of this training on job proficiency. One significant study is that reported by Goffard (1956). In this study, men who scored below the 5.0 grade level of reading on a standardized reading achievement test were given special literacy training. They were graduated from training upon achievement of reading at the 4.9 level. When compared with comparable control groups, i.e., marginally literate men who did not receive special training, the experimental group did slightly better on performance and knowledge tests given at the end of basic training. Differences were not considered of any practical significance, however, being less than five percent in any case.

Additional studies to evaluate the effects of literacy training on job proficiency in the Armed Services are reviewed in the book "Marginal Man and Military Service" (1965). The upshot of these studies is that, at the end of the '50's, little benefit to job proficiency had been demonstrated to result from the provision of training in basic literacy skills.

BASIC SKILLS EDUCATION IN DEFENSE: 1960-1975

In the 1960's, during Project 100,000, existing mental aptitude standards for acceptance into the Services were reduced. This downward revision of standards created a substantial influx of marginally literate men into the Services, particularly the Army, once again creating a demand for remedial literacy training to render these men sufficiently literate to qualify for job training.

In response to this demand, literacy training programs were initiated in the Army, Navy, and Air Force. These programs were established independently of one another, with each Service establishing its own policies, procedures, and practices, with the exception that all Services used the United States Armed Forces Institute (USAFI) Achievement Tests (Achievement Tests III, Abbreviated Edition, Form A; or USAFI Intermediate Achievement Tests, Form D) to identify men in need of remedial training in literacy skills.

In the Army, a man qualified for up to six weeks of Army Preparatory Training—APT (literacy training) if he scored below a school grade equivalency level of 5.0. The goal of the APT School, then, was to upgrade the man's literacy level until it was at or above the grade 5.0 level, a goal comparable to that established during World War II.

To determine the effects of the Army Preparatory Training Program on job proficiency, Fisher (1971) studied records of some 9,000 men who had completed APT. Those whose terminal reading score reached the fifth grade level were labeled "successful." Analyses were done to determine whether successful or unsuccessful literacy trainees differed significantly in a variety of indices of military performance (achievement of higher pay grades; eligibility for reenlistment; assignment to more technical jobs; military behavior ratings; military performance ratings; etc.). Results showed that, while successful trainees were slightly more likely to achieve a higher pay grade and to be judged eligible for reenlistment, successful and non-successful trainees did not differ on most indices of military status and performance.

In the Navy, Remedial Literacy Training programs were established at the Navy recruit Training Center at Greak Lakes, Orlando, and San Diego in 1967. Later, in the mid-seventies, these programs became known as Academic Remedial Training (ART). A review of the Navy's ART program as of 1975 is provided in Sticht, Fox, Hauke and Zaph, 1976. The summary statement from that review states that ". . . the Navy's ART system is best described as a non-standardized, short-term general literacy training program which uses traditional up-front teaching techniques and GED materials. Due

to variability of entry and exit assessment measures and the diversity of the program objectives, it was not reasonable to make any data comparison of student performance across the system." (p. B-43)

Duffy (1976) reviewed evaluation data for the Navy programs in Orlando and San Diego and for the Marine Corps program in San Diego. Data indicated that reliable gains of almost two grade levels were achieved in these programs. A study of retention of skills indicated that gains for the San Diego Navy program dropped by 1.2 reading grade levels within two weeks, but that a reliable increase of almost 1.0 year was achieved. Attrition studies indicated that graduates of the Marine Corps and San Diego programs had attrition rates comparable to those for average recruits.

In the Air Force, remedial reading training was initiated in 1966 at Lackland Air Force Base using the individualized, self-paced method devised by the Job Corps, supplemented by a one-week phonics training program. The Air Force program ran for four hours a day for 13 weeks (260 hours) with a goal of producing readers of sixth grade competency. Mockovak (1974) describes the Air Force program in greater detail.

In an unpublished report by Zaccaria (1971), data for 277 trainees in the Air Force remedial program indicated pre-test reading scores of 5.2 grade level, and post-test scores of 6.7, with an average gain of 1.5 grade levels. This gain held at 1.2 some 4 to 6 weeks later when the men were retested following basic military training.

Mockovak (1974) also described reading programs for Air Force personnel who read below the grade 9.0 level and who had completed basic training. A survey of Air Force bases revealed that 90% had reading improvement programs with a combined enrollment of 5,774 men during the period from April 1972 to 1973. Programs were arranged and taught by local colleges and high schools and used a plethora of methods and materials. Criteria for successful completion were frequently not explicit and appeared to vary from base to base. No evaluation data were cited to indicate the effects of basic skills training on job proficiency.

Overall, then, across the Army, Air Force, and Navy, during the 60's and up to the mid-'70's, basic skills programs were in operation to serve both the entry level recruit and for those needing higher level skill development, including high school completion. In addition to the latter types of program reviewed by Mockovak (1974) for the Air Force, the Army had off-duty education programs and the Predischarge Education Program (PREP), an on-duty remedial education program primarily for high-school completion. The Navy offered off-duty education at every Navy activity (ashore and afloat) encompassing a broad range of educational programs including basic and remedial education (Sticht, et al, 1976, p. B-44).

Summarizing the results of a review of basic skills programs conducted in 1971, an OASD(M&RA) report (McGoff and Harding, 1974) presaged a Defense Audit Service (1981) study conducted a decade later and noted that:

> "The literacy training programs operated by the Military Services to assist basic trainees with poor reading skills to adapt more readily to military training, are of recent origin. The literacy training programs developed by each Service have somewhat different goals. The training materials and methods, the techniques for identifying those trainees lacking functional literacy skills and the criteria for reentering them into the basic training cycle differ from service to service. The problems of defining adequate literacy skills, which are often related to job requirements or personal needs were resolved primarily through use of standard tests or observed performance in basic military training. A number of such tests were used to measure progress in class and to determine when reading skills reached the criterion level. The day-to-day operation of the literacy training programs was often based on the eclectic use of materials and methods to meet the needs of the moment. Methodologically, there was a lack of suitable material and proven techniques specifically designed for teaching reading skills to young adults." (pp. 3-4)

EXPERIMENTAL BASIC SKILLS PROGRAMS

While operational on-duty basic skills programs in the armed services have tended to be considered as temporary solutions for passing crises in which large numbers of personnel are required, by the late sixties and early seventies it was becoming clear to manpower policymakers that there would be a continued flow of accessions with basic skills problems into the armed forces even though the draft was to be suspended and no major conflicts were on the horizon (McGoff and Harding, 1974, p. 9).

Anticipating this situation, a tri-service Working Group on Listening and Reading in the Armed Services, meeting in November of 1970, took cognizance of the limitations of past and the then current literacy programs for effecting job performance, as indicated above, and recommended that:

> ". . . literacy training be designed following a systems approach which would include the thorough assessment of literacy requirements of the various military occupations, the orderly structuring of training programs geared to satisfying the occupational requirements, and, most importantly, well designed evaluative procedures to provide feedback for program development."

Consistent with this recommendation, the Army, Air Force, and Navy all undertook programs of R&D that investigated literacy demands of military occupations and eventuated in various versions of functional, or job-oriented basic skills training. (Sticht, 1975; Huff, Sticht, Joyner, Groff and Burkett, 1977; Harding, Mogford, Melching, and Showell, 1981).

THE FUNCTIONAL LITERACY (FLIT) PROJECT

Many of the concepts and procedures that influenced the Air Force and Navy R&D as job-oriented basic skills training, and that are currently an integral part of some of the ongoing and planned basic skills programs in the military, were developed in the Army-sponsored research to develop the Functional Literacy (FLIT) program (Sticht, 1975). Because of the centrality of the FLIT program for understanding current basic skills activities in the military, an extended discussion is given of the basic concepts of the program and its components, outcomes, and limitations.

The FLIT program was the first military basic education program based on both a theoretical body of knowledge that has since come to be called "cognitive science" and another called "instructional science" (Glaser, Pellegrino, and Leopold, 1978). A 27 September 1971 Work Unit Program Paper from the Human Resources Research Organization (HumRRO) that conducted the FLIT R&D, discussed several concepts that guided the development of the program. These included concepts regarding (1) the nature of the reading process, (2) the nature of the learning process, (3) the instructional process, and (4) the process of bringing about institutional change to facilitate the implementation of the FLIT program in the operational Army.

(1) The Reading Process: In the FLIT program reading was considered as a psycholinguistic process (Goodman, 1968) involving the combined use of fundamental psychological processes (perception, cognition) and linguistic processes (phonology, grammar, semantics). The psycholinguistic approach to reading emphasizes a developmental sequence in the acquisition of reading skills which proceeds as follows: first, early in life the new infant adapts to his world by means of the basic processes of perception and cognition. Eventually (in the usual case) these processes are brought to bear on the acquisition of language skills. The latter are typically acquired through

the processes of speaking and listening: the oracy skills. Following the acquisition of oracy skills, reading skills may be acquired if the person is in a literate society. The literacy skills consist of reading and writing and represent alternative modes of expression and reception of the same language base developed through listening and speaking. Writing is the visual form of the spoken language.

The psycholinguistic approach to literacy followed in FLIT emphasized both cognitive and language skills, and the more specific perceptual skills involved in using the written symbol system. By this approach, for FLIT students to achieve higher levels of literacy skills, they needed to achieve higher levels of cognitive (reasoning) skills used in conjunction with language, and for reading comprehension to occur students needed to have a body of job knowledge that could be expressed and comprehended in oral and written language.

(2) The Learning Process: In the FLIT project, learning was construed as an information processing activity. The information processing approach to learning emphasizes internal mental processes involved in learning as the result of an active, constructive process on the part of the learner. This differs from a strict behavioristic conception of learning in which the person is viewed primarily as a passive, reactive being, whose learned responses are the result of some automatic process of association among stimuli and responses.

For the FLIT developmental program, the most important aspect of the information processing approach to learning was the emphasis upon the active, construing nature of the learning person. This suggested that instruction should be designed that would stimulate active information seeking and processing, particularly of the type indicated in prior research to be important job-related functional literacy skills, e.g., learning how to locate information in job manuals, how to follow procedural directions in a manual, etc.

(3) The Instructional Process: The principals followed in the design of the FLIT instructional program were rooted not so much in theory as in empirical demonstrations of the success of instruction when these principals are followed:

Individualized Instruction: The instructional program was designed to permit students to work as individuals, within necessary limits (certain communications instruction demands social interaction), so that students could move through the program at a pace they could tolerate.

Functional Instruction: The FLIT program had as its ultimate goal the rendering of men capable of utilizing job reading materials in an effective manner. To this end the program emphasized the use of job-related reading materials.

Pre-Established Systematic Training: The FLIT program used linear sequenced skills of reading, with modular format involving module-mastery tests and branching loops for remedial instruction within the program. This provided a core of individualized instruction in reading and writing which was supplemented by planned group activities.

Student-Assisted Instruction: To a limited degree the FLIT program utilized student-produced oracy/literacy materials and involved advanced students in the more routine records management activities. The goal here was to motivate students by giving them the feeling that they were doing a responsible job in addition to attending school. This approach provided for more individualized attention to students, and reduced the administrative/management manpower needs.

(4) The Process of Change: In designing an instructional system which is supposed to replace ongoing systems, it is necessary that provisions be made to insure that the new program is understood and accepted by those who will use it. To this

end, the FLIT developmental package included a workshop to be presented to administrators and instructors at the various sites at which the FLIT program was implemented, and administrators and instructors were consulted prior to the development of the FLIT program to determine problems with the ongoing programs, and to solicit noteworthy ideas to be incorporated into the new program.

THE FLIT INSTRUCTIONAL PROGRAM

The FLIT project developed a job-oriented basic skills program that included special reading tests called Job-Reading Task Tests (JRTT), which assessed how well Army personnel could read military materials, and two curriculum strands that taught job-related reading skills.

The Job Reading Task Tests assessed trainee skill in using indexes for locating information, extracting information from tables, extracting information from narrative prose, and following procedural directions for filling out forms. These tasks were identified through task analysis techniques as critical reading tasks for performing military jobs.

The Strand I curriculum was based on the information processing theory of learning as an active, problem-solving process and required students to work with actual job reading materials to solve problems posed by structured worksheets. Six instructional modules were developed each with pre- and post-tests to assess mastery of use of tables of content, indexes, tables and graphs, bodies of manuals for locating information, following procedural directions, and completing job-related forms. Students worked on such modules developed for the job field to which they were being assigned, so the material had high functional relevance to them. Since the purpose of the Strand I curriculum was to help students learn to do something with information extracted from written material, it was called the Reading to Do Strand.

Strand II was designed to help students learn from written material, and was called the Reading to Learn strand. Drawing upon both the psycholinguistic theory of reading and the information processing theory of learning, the Strand II curriculum was designed to provide a knowledge base regarding jobs in the Army, to provide practice in transforming this knowledge expressed in written language into other forms, such as pictures, schematics (matrices; flow charts), or oral language. The psycholinguistic theory that oral and written languages represent the same knowledge base stimulated the idea that basic concepts of a job field could be presented in detailed summary form, and students could bring their own background knowledge to bear in learning and understanding the concepts by drawing pictures of what they read, or analyzing what they read and making categories for sorting information into matrices, or in presenting the flow of events or steps in a procedure in a flow chart. These transformations of the knowledge base presented in written passages were learning strategies (O'Neil, 1978; O'Neil and Spielberger, 1979) to help the students acquire the job knowledge they needed to comprehend job written materials. The psycholinguistic theory of reading made it clear that reading comprehension requires that the reader have the necessary background knowledge for comprehension to occur.

The FLIT program was a six-week program, with about 120 hours available for instruction, that occurred just prior to a student's job technical skills training program.

Evaluation of the program was accomplished by formative data from the pre- and post-module tests of Strand I, and summative test data from a standardized reading

test and the Job-Related Reading Task Tests (JRTT) both of which were given pre- and post-FLIT training. Evaluation data for over 700 students showed that:

(1) Students made three times the improvement in job-related reading as in general reading, indicating that they were learning what was being taught.

(2) Students in the FLIT program performed three times better than comparable students in other Army and Air Force programs, indicating that general literacy training does not make as much impact on job-related reading as does job-related reading training.

(3) Retention studies indicated that 8 weeks after FLIT training, personnel retained 80% of their end-of-course gain in job-related reading, but only 40% of their end-of-course gain in general reading.

(4) Many students in the FLIT program made little gain and failed to master or even attempt some instructional modules and activities, suggesting the need for a longer period of development for some Army personnel.

Dissemination and Implementation of the FLIT program was accomplished in all Army Training Centers in 1974 under the name of Advanced Individual Training/ Preparatory Training (AITPT). Monitoring of the six Army posts in which FLIT/ AITPT was implemented indicated that comparable gains were achieved in those operational settings as in the experimental FLIT school. However, there were difficulties in keeping job-oriented materials current and in training instructors in the Strand II analytic techniques. Further, there were some perceptions, especially among senior education administrators, that the FLIT job-oriented basic skills training was not "real" education in basic skills leading to a high school diploma or equivalency. Rather, it was viewed more as job technical training. For these reasons AITPT did not initially receive the high-level support in the Army education system that it did in the Army training system. However, as indicated in Chapter 3, the Army is currently moving to adopt the job-oriented approach to literacy, and the Navy has developed and implemented the Job Oriented Basic Skills (JOBS) program based on the approach developed in the FLIT project.

INTEGRATED JOB SKILLS AND BASIC SKILLS TRAINING

As a part of the FLIT project, a special study was conducted to determine if the FLIT job-related literacy training could be integrated into a job technical training program so that students would not have to go to a separate six-week program before going to advanced individual training (AIT-i.e., job technical skills training). Such "front-loaded" programs are expensive and identify the person as a remedial student. It was therefore of interest to see if the literacy and job skills training could be accomplished at the training site, during the training day and importantly, with no increased cost in training.

To accomplish the study, the Supplyman's course at Fort Ord, California was first system-engineered to change it from a lecture-platform, group paced, lock-step course of instruction into a self-paced, modularized, performance-oriented course (Hungerland and Taylor, 1975).

Next, the FLIT materials for personnel in clerical fields was modified and incorporated into a two-hour block of time during the AIT training day. Students reading below the 8.0 grade level were placed in the job reading training modules for the two-hour period.

Results showed that, due to the systems-engineering of the course, faster learners completed sooner, thereby reducing the overall man-hours of a given class in training. Adding the reading training for the poorest readers did not offset the savings in man-hours due to self-pacing, and reading improvement on Job Reading Task Tests approximated that for the six-week FLIT program, with pre-test scores of grade level 5.5 on the JRTT increasing to 7.2 in an average of 25 hours of reading training.

An evaluation of job-related reading in the front-loaded AITPT program at Fort Dix (Larson, 1979) compared attrition from Mechanics, Truck Driver, and Cook's technical schools for trainees who had or had not attended AITPT prior to attending technical school. It was found that, overall, attrition rates were very low, yet the literacy students had an attrition rate of 1.3% (1 out of 76) while the control group with no literacy training had an attrition rate of 2.2% (2 out of 91). Time for completing the self-paced performance-oriented Mechanics course was reliably lower for literacy students, though no such effect was found for the Cook and Truck Driver schools. Today, the front-loaded AITPT program at Fort Dix has been integrated into job technical skills training (Chapter 3).

IMPACT OF FLIT ON MILITARY BASIC SKILLS PROGRAMS

The FLIT research, and research on job-related literacy that prepared the way for FLIT, has led to several major concepts that have influenced some of the current basic skills programs in the armed services to a greater or lesser extent:

(1) The literacy gap. This concept expresses the idea that a gap can exist between the literacy or basic skills demands on requirements of a military job or career and the basic skills of the personnel required to fill the jobs. One approach that has been used across the Services to assess this literacy gap is to contrast the readability levels of training manuals to the reading skills of trainees as indexed by standardized reading tests (see the section on readability in Chapter 1 of this report). Given a gap between the reading difficulty levels of materials, and the reading skills of personnel, three strategies can be pursued to close the gap: recruit more highly skilled personnel, reduce the quantity of materials and/or the difficulty of materials through training or document design techniques, and increase the basic skills of personnel through basic skills programs. All three strategies are being used by the military today.

(2) Job-specific versus general literacy. In research prior to the FLIT Project, (Sticht, Caylor, Kern, and Fox, 1971) the special Job Reading Task Tests (JRTT) were developed that were subsequently used, in modified form, to assess the job-reading skills of FLIT students. In the FLIT program, it was found that job-oriented literacy training improved JRTT Performance much more than it did general literacy test performance. Hence it was concluded that job-specific literacy could be improved while general literacy, as measured by a standardized test, stayed constant or improved only slightly. This was confirmed by Air Force research (Huff, et al, 1977), in which a Job Oriented Reading Test was developed and used to evaluate a Job Oriented Reading Program developed to assist airmen reading below the 9th grade level to read and pass their career development correspondence courses.

Additional research by the FLIT team showed that being selected for special aptitude in a career field and undergoing job training, without literacy training, could improve the performance of personnel on JRTT by as much as 1 to 2 grade levels even though general literacy skills were held constant in the research. This, coupled with the results of the FLIT training itself, shows the importance of relevant knowledge to

reading test performance, and suggests the possibility that special aptitude (knowledge, experience) can lead to special reading skills not necessarily tapped by general reading tests. This, and the fact that most job reading is in a limited sphere and rather repetitious (Sticht, Hauke, Fox, and Zapf, 1976), may explain why many personnel assessed as low in basic skills on general basic skills tests (AFQT; GT; standardized reading and arithmetic tests), may in fact perform satisfactorily in a job.

(3) Job training and basic skills training: The FLIT research demonstrated that job technical skills training and basic skills training do not have to be mutually exclusive, with basic skills first being learned and then applied to the learning of job skills. Rather, both may be developed together. In fact, this was recognized in World War II when the Army developed the Army Life series (Private Pete) and the Navy developed the Navy Life series (Sailor Sam) of reading materials. Those materials taught basic skills within the functional context of life on an Army post or aboard ship. Words such as "barracks", "battleship", etc., were used to teach reading decoding and as vocabulary items having value for military service. Though not aimed at technical skills training, like the FLIT program, the concept of functionally relevant material to teach adult basic skills was used in the WW II programs. This idea was subsequently lost and resurrected in the FLIT program and is currently being reinstated for Army Life (see the Army's Functional Basic Skills Program discussion in Chapter 3).

(4) Long term development versus brief remediation. Review of basic skills programs in the military and civilian settings during the FLIT development, and the experience in the FLIT experimental project, indicated that "one-shot" general literacy programs of three to six weeks duration are not likely to improve the literacy skills of trainees to the extent needed to substantially affect their capacity for work and career progression (Sticht, 1975). Even job-oriented programs can make only limited progress for many trainees. Evidence was obtained which indicated that:

1) Brief literacy programs made only 1 to 2 "years" gain on standardized tests, and much of this gain disappeared after training.

2) Literacy students not only had lower reading skills, but also low oral language comprehension scores and low oral vocabulary scores (Sticht, 1982), indicating the need for more extensive concept and language development in addition to skills in decoding written language and using graphic tools such as charts, graphs, matrices, flow charts, etc.

3) Experimental studies that compared marginally literate FLIT students reading at the 5th grade level to typical 5th grade level children on the performance of oral and written language tasks indicated that the FLIT trainees could not perform the tasks as well as the 5th grade students (Sticht, 1982). This indicates that adults who score at the 5th grade level on grade-school referenced reading tests are not comparable to students who are in the 5th grade and reading at the 5th grade level. Thus, the use of grade school tests with adults is a questionable practice.

The foregoing suggests that adult literacy training, in or out of the military, must be of greater duration than is typically the case and requires extensive practice in oral

and written language use if adult literacy students are to be developed to the point where their oracy and literacy skills are comparable to typical students at various grade levels.

RESOLVING THE GREAT DEBATE: A POINT FOR BASIC SKILLS PROGRAMS

Regarding the question raised in the great debate regarding the effectiveness of basic skills education in the military, the FLIT research demonstrated, for the first time, that many recruits were low in literacy skills specifically needed to perform a variety of military job reading tasks, such as looking up information in the tables of contents of Army manuals, or completing military forms, and that job-related literacy training made genuine and long-lasting improvement in the abilities of less literate personnel for performing job reading tasks.

The question of whether or not graduates of the FLIT/AITPT schools actually utilized their new skills was not addressed, though results of follow-up questionnaires suggested that at least some of the FLIT/AITPT graduates thought they had acquired improved reading skills and that they were applying those skills in their job technical training program. But the question of whether or not new competence is developed, is separate from that of whether or not new competence is applied. Training programs, whether for basic skills or job technical skills, can only strive to develop competence. Getting personnel to use their new competence is a management and leadership function, and depends upon having the opportunity to use the skills. In self-paced training which is "hands-on, performance oriented" in nature, there may be little opportunity for using newly developed literacy skills, and attrition and performance indicators may not be very sensitive to the efforts of basic skills training, as suggested in Larson's (1979) work.

Thus, at the mid '70's, the issue of whether or not basic skills training is effective was only partially resolved. Yes, it had been demonstrated that job-oriented basic skills training can improve the performance of essential job reading tasks. But, no, it had not been demonstrated that the improvement of job reading skills leads to improved performance in job technical skills training or on the job. Evidence bearing on the latter issues is becoming available only now, as a part of the evaluation of the Navy's Job-Oriented Basic Skills (JOBS) program. That program, and the basic skills programs conducted by the other Services are discussed in the following chapter.

Chapter 3

BASIC SKILLS EDUCATION PROGRAMS IN THE MILITARY: PRESENT AND PROJECTED

This chapter presents information about current and projected basic skills education in the armed services. While some information is presented regarding earlier programs, most of the information pertains to programs in operation as of the summer of 1981. The review is based on papers prepared by the Services for the Joint Service Working Group on Literacy/Basic Skills, supplemented by review of other military documents describing basic skills research, development and operational activities in the Services. Additionally, site visits were made to several military installations to obtain first-hand experience with some basic skills programs. Information from those visits has been included where appropriate.

The chapter first presents an overview of the basic skills programs conducted by the armed services. The general overview is followed by a detailed description of the various basic skills programs conducted by the Air Force, Army, Marine Corps, and Navy.

OVERVIEW OF BASIC SKILLS PROGRAMS IN THE MILITARY

Table 12 provides an overview of the various basic skills programs existing in the Department of Defense and the four Services as of the summer of 1981. The programs are categorized according to a timeline that describes the general sequence of events that recruits go through in applying for and entering into military service. The first column presents pre-enlistment programs that are conducted by the Department of Defense. These are essentially referral programs in which applicants for military service who fail to meet enlistment standards are referred to civilian adult basic education (ABE) programs, to the Job Corps, or to an English as a Second Language (ESL) program.

The adult basic education (ABE) program was a one-year pilot project in which the DoD and Department of Education collaborated to correct the educational deficiencies of applicants who failed to qualify for military service. In this program, an applicant who failed to qualify on the military entrance examination was referred for remedial basic skills training to one of the adult basic education centers supported by the Adult Education Division of the Department of Education. However, it was found that many of those referred did not attend or did not complete the program. Therefore the ABE referral program was discontinued in April 1980. The low enrollment was attributed to a number of factors: lack of motivation, financial problems, and lack of transportation to the learning centers.

The pre-enlistment basic skills project conducted with the Job Corps of the Department of Labor was initiated in May of 1980 to provide military referrals to the Job Corps program. Unlike the ABE programs, the Job Corps offers a residential environment and economic support that overcame many of the difficulties encountered in the ABE program.

Table 12

Basic Skills Education Programs in the Military – 1980-1981

DoD Pre-enlistment Programs	Recruit Training Programs	Job Technical School Programs	Unit/Duty Station Programs
	ARMY		
ABE Job Corps ESL	Basic Skills Education Program (BSEP I)	BSEP II BSEP I	BSEP II BSEP I ASEP Off Duty HSC
	AIR FORCE		
	BMT Reading Proficiency Program	STEP ASP PLATO-SIP MSIP TT-IDEA	IDEA Off Duty HSC
	NAVY		
	Academic Remedial Training	JOBS	FST BEST Off Duty HSC
	MARINE CORPS		
	None	None	BSEP Off Duty HSC

Acronyms: DoD: ABE-Adult Basic Education; ESL-English as a Second Language; Army: BSEP-Basic Skills Education Program; ASEP-Advanced Skills Education Program; Air Force: BMT-Basic Military Training; STEP-Skill Training Enhancement Program; ASP-Academic Skills Program; PLATO-SIP-PLATO Skills Improvement Programs; MSIP-Math Skills Improvement Programs; TT-IDEA-Technical Training; Individualized Development and Educational Advancement Program; IDEA-Duty Station IDEA; Navy: JOBS-Job-Oriented Basic Skills FST-Functional Skills Training; BEST-Behavioral Skills Training; Marine Corps – BSEP-Basic Skills Education Program.

The English as a Second Language (ESL) program is conducted in Puerto Rico. In this program, applicants for military service who do not qualify due to low skills in comprehending the English language are provided the opportunity to obtain up to six months of English language training to qualify them for military service.

As indicated earlier, the Congress in FY78 directed the Department of Education and Defense to establish preenlistment programs to upgrade basic skills of applicants for military service. This has been difficult because neither of these federal Departments directly control adult basic education programs. Neither have special incentives nor has support been offered to adult basic education programs to provide special training for military-bound youth. As Table 8 shows, some 55,000 applicants for military service in fiscal year 1981 read below the 5.0 grade level. The provision of adequate basic skills education to so many is a large problem, and the management of such a training effort is difficult at a central, federal level such as the Department of Defense or Education. The latter is a difficult enough task even when the basic skills programs are managed by the military services, as the following discussion indicates.

Basic Skills Programs for Military Enlistees

The programs of major concern in this report are those offered by the Services after a person has been enlisted. Table 12 lists the programs conducted by the Air Force, Army, Marine Corps, and Navy at three times following enlistment: (1) during recruit training (RT), which is the initial basic military training (BMT) that new recruits receive, (2) during job technical skills training, which ordinarily occurs following basic recruit training, and (3) during assignments to a permanent duty station.

Table 12 indicates that, with the exception of the Marine Corps, all of the Services make some form of basic skills education available from the time the new recruit enters the Service. Of the 19 different programs conducted after the person enters active military duty, 15 are conducted during duty hours, and four are offered in off-duty time. The latter are high school completion programs that are provided by local education agencies, in the United States, and by contracted institutions overseas. Such programs offer both high school equivalency certificates (the General Educational Development - GED certificate) or high school diplomas.

The on-duty programs that are offered in response to specific military-related needs constitute the primary programs of interest in this report. It should be noted, however, that the distinction between on- and off-duty basic skills programs is a critical one. The Fiscal Year 1978 DoD Appropriation Bill directed that high school completion programs be conducted during off-duty time. The impact of this directive is indicated in an Army briefing that reports that the number of high school diplomas granted fell from 17,434 in FY77 to 3,169 in FY80. No doubt this dramatic decrease reflects the fact that enlisted personnel prefer to attend education programs during rather than after duty hours (Sticht, Fox, Hauke, and Zapf, 1976).

A matter of some concern to military educators is that possession of a high school diploma or its GED equivalency is a requirement for promotion to non-commissioned officer ranks. In this sense high school completion is related to military requirements and, according to Congressional directive, basic skills programs related to military requirements can be offered during duty hours. On the other hand, the Congress has directed that high school completion programs be attended only in off-duty hours. As will be noted, in at least one instance (see the discussion of the Army's Functional Basic Skills Program below) this has led to the search for innovative programs to make job-related, on-duty basic skills programs more job and career-oriented and contributory to a high school diploma or its equivalency.

BASIC SKILLS PROGRAMS IN THE FOUR SERVICES[1]

In this section each of the on-duty programs listed in Table 12 are briefly described. Additionally, information about projected programs will be provided for the Army and Navy. At the present time, the Air Force and Marine Corps have not projected changes to the programs in Table 12.

Tables 13, 14, and 15 present detailed information about the 15 on-duty programs conducted by the Services. These tables permit cross-service comparisons among several categories of information:

> Table 13 presents information about the objectives and other characteristics of these programs and the populations they serve. The first column of this table gives the name of the programs arranged by Service. Column 2 cites the objective of each program as given in the papers submitted by the Services. Column 3 indicates whether a program exists in all installations of a particular kind, or is unique to a single installation or group of installations. Columns 4 and 5 tell where and when in a Service member's military career each program is available. Column 6 describes the population for which each program is intended and the mechanism by which members of this population are identified and assigned or enrolled in each program. Column 7 presents reported number of participants or course enrollment by fiscal year.
>
> Table 14 presents data descriptive of the programs themselves. Column 2 indicates whether a program is operated and staffed by employees of the Service (in-house) or through contract to another institution. As can be seen, five of the 15 programs are conducted in-house, while one program, the Navy's ART program involves both contract and in-house arrangements. Column 3 gives program length, either mean length for variable length programs or recommended course length. Program length will be seen to vary greatly from a low of 14 hours for mean length of the Air Force BMT Corrective Literacy Program to a high of 360 hours allowed for Army BSEP II. Column 4 lists the basic skills reported to be addressed by the programs surveyed. These range from a very job specific mathematics program for the Air Force (MSIP) to "one of the basic skills" for the Navy FST. Four of the programs cite skills such as study skills, time management and testmanship as being included in the curriculum. One program, the Navy's BEST, appears to focus on the so-called "life-coping" skills. Additionally, two of the Air Force's programs offer "Attitude" and "Adult Responsibility" training. Column 5 describes the orientation of each program. General programs attempt to teach basic skills using unspecified general materials or a wide

[1] The detailed tables in this section were prepared by Dr. Lydia R. Hooke of HumRRO.

Table 13

Basic Skills Education in the Military: Programs, Objectives, and Population Served

Service/ Program 1	Objective 2	Service Wide 3	Location 4	When Delivered 5	Population Served 6	Number of Participants Enrollment 7
AIR FORCE						
BMT Reading Proficiency Program	To improve the reading comprehension and vocabulary levels of those identified as deficient.	Yes	USAF BMT School Lackland AFB	Corrective: During BMT After Hours Remedial: Pre BMT	Corrective: Those scoring 6-7.9 on TABE. Remedial: Those scoring below 5.9 on TABE, if corroborated by LAB. Testing mandatory at BMT and assignment automatic.	Corrective: 80:* 1,000 Remedial: 80: 63
Skill Training Enhancement Program (STEP)	To enhance ability of student airmen to successfully complete technical training.	No	Sheppard AFB	After BMT and Awaiting TT	No criteria, except awaiting training.	280 as of 1980
Academic Skills Program (ASP)	To raise student success in technical training.	No	Lowry AFB	After BMT and Awaiting TT	Students awaiting training with RGL below 10 or students with average RGL scheduled for difficult courses.	300 as of 1980
USAF PLATO Skills Improvement (PLATO SIP)	To improve reading skills of students entering medical or math skills of students entering Maintenance Analysis classes.	No	Sheppard AFB Chanute AFB	After BMT Before BMT	Students with TABE RGL below 10.4, those deficient on math TABE entered in Maintenance Analysis; referrals for academic problems.	328 as of 1980
Math Skills Improvement Program (MSIP)	To help students who have been identified as being weak in basic skills entering courses requiring math proficiency.	No	Lowry AFB Keesler AFB	After BMT Before TT	Students scoring below 73% on basic math pretest. Assignment depends on class start date.	Lowry: 466 Keesler: 82
Individualized Development and Educational Advancement Program Support (TT-IDEA)	To provide opportunities for service personnel to complete remedial courses required for job related training or work requirements. To provide opportunities for service people who have not completed high school to reach that level.	Yes	6 TT Bases	During Technical Training	Mandatory for people in training with below 10 RGL (TABE). Volunteers. Referrals from supervisors or COs.	
Individual Development and Educational Advancement Program (IDEA)	To provide basic skill developmental training for enlisted personnel.	Yes	Duty Bases	During First and Subsequent Enlistments	Personnel scoring below 9 RGL or otherwise having trouble progressing in OJT may be directed to participate. Also volunteers.	79: 12,500 80: 15,000 81: 17,000
ARMY						
Basic Skills Education Program I (BSEP I) (1) Literacy (2) ESL	To provide soldiers basic literacy instruction in reading and arithmetic to form a basis for MOS training. 2. To provide instruction in ESL to soldiers who do not demonstrate acceptable ability to speak, understand or read English.	Yes	22 Training Sites	Lit: During IET After BMT ESL: Before BMT	Literacy: Soldiers testing below 5th grade on ABLE I. ESL: Testing below 70 on English comprehension level test. Referred by BT troop commander then assigned to literacy or ESL on basis of AEC recommendation.	Literacy: 79: 12,245** 80: 15,481 81: 15,681 ESL: 79: 1,460 80: 3,073 81: 4,119
Basic Skills Education Program II (BSEP II) (1) Literacy (2) ESL	To improve educational skills required for military duty performance and to enhance career growth.	Yes	326 Army Education Centers	During First Enlistment	GT less than 90. (64%) SQT failure (14%) Self or commander referred (22%)	Literacy: 79: 114,394 80: 143,695 81: 161,383 ESL: 79: 4,683 80: 5,031 81: 4,118
Advanced Skills Education Program (ASEP)	To improve educational skills required for military duty performance and to enhance career growth for soldiers in grades E6 and above.	Yes	Permanent Duty Stations	During Second and Subsequent Enlistments	Non-commissioned officers or soldiers serving in those positions who have not mastered educational skills inherent in their jobs.	81: 4,339
MARINES						
Basic Skills Education Program (BSEP)	To provide training in basic skills of English, reading, math and ESL.	Yes	18 Bases	First Assignment and Later	Those testing below 8th or 9th RGL (test unspecified) or identified on the job as deficient. Assignment through screening RGL tests, observation on the job & CO's recommendations.	80: 4,409 81: 3,279
NAVY						
Academic Remediation Training (ART)	To upgrade literacy skills for certain recruits to enable them to complete training successfully.	Yes	RT Centers	Before RT and After RT Failure	People scoring below 6th RGL on 2 Gates-MacGinitie tests; some who fail RT also sent to ART.	79: 3,237 80: 3,861 81: 3,109
Behavioral Skills Training (BEST)	To provide behavior skills training to low and marginal performing first term enlisted personnel that will enable them to successfully complete obligated service.	No Just Atlantic Fleet		First Term With 2 Years Remaining	Commander refers individuals who have potential for completing enlistment but are unlikely to do so given present demeanor and record of achievement.	79: 107
Functional Skills Training Program	To provide functional skills training to Navy personnel so that they can enhance their military performance.	Yes	Duty Bases	Mainly E2, E3, E4	Those testing below 12.9 RGL and supposedly above 9. Referred by career counselor supervisor or CO.	79: 3,819 80: 17,537 81: 25,377
Job Oriented Basic Skills (JOBS)	To provide and upgrade job-relevant skills of personnel whose aptitude scores would normally exclude them from specialized skills training. (A School)	No	Service School Command San Diego	Direct From RT or After 6-18 Months of Duty	Non-school eligible recruits demonstrating motivation and potential for future performance. ASVAB criteria for entry into each strand. Either selected at RT or recommended by CO.	79: 50 80: 374 81: 1,309

*Years given are Fiscal Years (beginning October 1). **Army data are number of course enrollments. One participant may have enrolled in several courses.

Table 14

Basic Skills Education in the Military: Program Descriptions

Service/ Program 1	Contract In-House 2	Length of Program 3	Basic Skills Addressed 4	Orientation 5	Instructional Mode 6	Materials Used 7	Stand-ardized 8
AIR FORCE							
BMT Literacy	In-house	Corrective: Mean: 7 training sessions of 2 hours Remedial: Mean: 7.7 training days	Corrective: Decoding Remedial: reading, motivation, and time management	General	Self-paced	Remedial: Science Research Associates Materials	Yes
STEP	In-house	10 days	Listening, visual interpretation, reasoning, study skills, adult responsibility			AV presentations; work books	N/A
ASP	In-house	Variable (Mean: 5 4 hour sessions)	Study skills, testmanship, memory, vocabulary, attitude	Military Job-oriented	Flexible entry/exit	AF owned materials, actual job materials	N/A
PLATO SIP	N/A	Maximum: 33 hours Mean: 18-20 hours	Reading, math	General	CBI	PLATO programs	Yes
MSTP	In-house	Lowry: Mean 3 days	Math	Mixed	Self-paced with individual instruction		No
TT-IDEA	Contract		English grammar, reading, math	General	Self-study		No
IDEA	Contract	Up to 10 hours per week	Reading, math	General			No
ARMY							
BSEP I	Contract	Literacy: Reading: 120 hours in 6 weeks. Math: 60 hours in 6 weeks. ESL: 6 weeks	Literacy: Reading, writing, listening and oral communication, arithmetic. ESL: Emphasis (or focus) on speaking and listening	Job-oriented		Lit: Soldiers manuals, DA pamphlets, regulations. ESL: American Language Course (ALC)	No
BSEP II	Contract	Lit: Up to 360 hours	Reading, computational writing, speaking and listening	Job-oriented		Lit: Contractor developed materials. ESL: ALC	No
ASEP	Contract			Job-oriented		Developed by contractor to encompass tasks in Soldier's Manuals.	No
MARINES							
BSEP	Contract	100-234 hrs. varies	English, math, reading, ESL	General	Varies	Commercial	No
NAVY							
ART	Contract/ In-house	105-175 hours	Decoding, vocabulary, comprehension, reading rate, study skills	Mixed	Modules prescribed on basis of diagnostic test. Mix of lockstep and individual	Mixture of Navy and Commercial	Yes
BEST	In-house	30 days	Military skills, individual growth, responsible living, counseling	Military life coping	Mixture of lockstep and individual	Includes some Blue Jacket manual	Yes
FST	Contract	45 hours	One of the basic skills	General			No
JOBS	Contract		Reading, listening, comprehending, study skills, math	Job-oriented	Lock-step: 4 job-oriented strands each	Each strand uses appropriate tech manuals and materials	Yes

Table 15

Basic Skills Education Programs in the Military: Program Outcomes

Service/ Program 1	Exit Criteria 2	Percent Participants Completing 3	Pre-Test/ Post-Test Improvement 4	Post-Course Performance Measure 5	Control/ Comparable Performance 6
AIR FORCE					
BMT Reading	Goal: 6th RGL; Ultimately 9th RGL	Corrective: 89% Remedial: 73%	TABE Improvement of Corrective: 2.3 RGLs. Remedial: 2.9 RGLs		
STEP					
ASP				"Positive reaction from students/instructors"	
PLATO SIP	Must answer each lesson correctly before going on to the next one	52% (most attrite because classes start)		Lower elimination rates and block failures	
MSIP			Lowry: Only 36 failed post-test		
TT IDEA					
IDEA					
ARMY					
BSEP I	5th grade level		Lit: Sample gained .93 (TABE) RGL ESL: Mean gain of 12 ECLT points	Lit: 29.4% enrolled, discharged in IET ESL: 9% enrolled, discharged during IET	Comparable group 21.5% discharged 18.7% eligible but not enrolled, discharged
BSEP II	Target of 9th RGL TABE. Criteria for progress on modules not specified		Mean GT improvement of 20.4 pts.	70% of grads complete GED. Positive survey responses	
ASEP					
MARINES					
BSEP	9th RGL	FY80: 89% FY81: 82%		Positive reaction from students/instructors	
NAVY					
ART	6th grade reading comprehension	Attrition in ART and RT=11.4%	Gates-MacGinitie RGL up 2.5. Wide range achievement test up 1.2	Attrition in ART and RT: 11.4%	Navy wide attrition: 10.7% 4-6 RGL: 20.4% Below 4: 64%
BEST		85%		After 2 months 72.4 of grads got enlisted evaluative ratings average or above. After 6 mos. 56.6% got average or above.	
FST			88% achieve at least 2 RGL improvement		
JOBS			Mean improvement 4 pts. or less on ASVAB components	JOBS grads complete A School in 18.7 days, 14.8 attrition	Normal A School time 18 days; 11.4% attrition

variety of materials and applications, while job-oriented programs attempt to focus on the skills and materials the Service member encounters or will encounter on his job. Seven of the fifteen programs are reported to be job-oriented, six are general and three are mixed or have a military, but not specifically job-oriented emphasis. Column 6 gives instructional mode for programs. All Air Force programs which reported mode are self-paced or self study while Navy programs are either lock-step or mixed lock-step and individualized. The Army did not report instructional mode. Column 7 lists materials used in courses. It will be noted that programs with job orientation tend to use actual military materials. Column 8 tells whether programs are standardized or vary from base-to-base or command-to-command. This column indicates that the majority of programs are reported to be non-standardized.

Table 15 gives reported data relevant to program outcomes, which could be used for program evaluation. Column 2 gives exit criteria for each of the programs citing them. Exit criteria are the conditions under which students are considered to have completed a program. Column 3 indicates what percent of students who enter the course complete it. This data was reported for 4 of the 15 programs. Column 4 cites improvement on test scores of Service members who complete a program. In no case were pre-test and post-test difference scores available for a control group of comparable students not enrolled in the program. Column 5 cites post-course performance. Comparable performance measures for people who had not been in a program are given in Column 6.

In the summaries of the various Service programs below, the information in Tables 13, 14, and 15 is further explained.

Basic Skills Programs in the Air Force

The Air Force conducts a variety of basic skills programs comprised of three major types: those conducted during basic military training (BMT), programs provided in conjunction with initial job technical skills training, and basic skills programs provided through civilian institutions at most Air Force installations. Each of these types of program is discussed in more detail below.

(1) Basic Military Training (BMT) Literacy Programs: During Air Force BMT there are two basic skills programs provided. One is called the Remedial Reading program and the other the Corrective Reading Program. The Remedial Reading program is for personnel who score below a 5.9 RGL (reading grade level) on the Test of Adult Basic Education (TABE), which is administered to all personnel who enter the Air Force. The Remedial Reading program is conducted prior to BMT during duty hours and, on the average, students spend about 8 training days in the program. Instruction is provided in-house, meaning that the instructors are Air Force personnel and the facilities are military. The instruction is in general literacy, that is, not job-oriented, it is self-paced

and uses the Science Research Associates Self-Instruction Reading Improvement Course. Average improvement on the TABE in pre- to post-testing is 2.9 RGL.

The Corrective Reading program is for recruits who score from 6.0 to 7.9 in RGL on the TABE and is conducted by Air Force instructors as an additional duty each duty day from 1730-1930, which permits the trainee to continue BMT while receiving reading improvement training. In Fiscal Year '80, 1000 trainees participated in the Corrective Reading program, in contrast to only 63 who were enrolled in the more basic Remedial Reading program in FY80. For an average of 7 training sessions, each of 2 hours duration, average achievement in the Corrective Reading program was 2.3 RGL on the TABE.

(2) Basic Skills Programs in Technical Training. The basic skills programs in the Air Training Command are oriented toward the roughly one-third of Air Force personnel who read below the 9.0 RGL, and who have completed basic military training (BMT).

Analyses of the readability levels of training publications in Air Force jobs and training programs indicate that 80% have publications written at the 10th reading grade level or higher (see Table 6). Therefore, many trainees reading below the 9th grade level are below the skill levels required for efficiently using technical training materials.

Air Force technical training schools, acting at the discretion of the local commanders, have responded with a variety of literacy programs, as indicated in Tables 12-15 of which there are three basic types: (1) those established primarily to provide constructive utilization of delay time while students await entry into scheduled classes (STEP; ASP; PLATO-SIP), (2) those established as formal prerequisite programs to prepare airmen with skills needed for successful learning in technical schools (MSIP), and (3) those established primarily for enlisted personnel stationed at technical training bases as their duty station, who are in job upgrade training and who read below the 10th grade level, or who are directed by their supervisors to attend basic skills training (TT-IDEA). The latter also provides opportunities for personnel who have not completed high school to reach the secondary education level.

Taking cognizance of the current state of affairs in the operational basic skills programs, as well as the continuing stream of findings from research on functional basic skills training, the Air Force is evolving toward an integrated basic skills and technical skills training program. In this approach, basic skills training will be incorporated directly into the initial job technical skill training specialty. This will obviate the need for a separately identified basic skills program during technical training.

(3) Basic Skills Programs at the Duty Station. Following completion of Basic Military and Technical Training, Air Force enlisted personnel arrive at their initial duty assignments. There, they are eligible to participate in the IDEA—Individual Development and Educational Advancement program. This program is offered through each base's Education Service Center by contract with civilian education institutions. Each base determines its own curriculum and instructor requirements. The purpose of the IDEA program is to provide basic skills (primarily reading and mathematics) developmental training for enlisted personnel.

All enlisted personnel are eligible to participate in the IDEA program. High school graduate volunteers participate on a fully funded basis, while non-high school graduates participate during non-duty hours on a 75% tuition assistance basis. In addition, all personnel scoring below the 9th grade level (or otherwise experiencing difficulty progressing in on-the-job training due to learning deficiencies) may be directed to participate in the fully funded program during duty hours.

As the data of Table 13, Column 7 show, participation in the IDEA program has consistently increased from 12,500 in fiscal year 1979 to 17,000 in fiscal year 1981, a 36% increase in three years. When coupled with the BMT and technical training

programs it is apparent that, though the Air Force has the highest basic skills selection criteria of the four Services, personnel are still being accessioned that Air Force management perceive to be in need of basic skills training.

Again, though, the ambiguity towards basic skills training characteristic of the great debate reveals itself in the Air Force programs. This is most clearly indicated in the technical training programs in which attendance is determined primarily on the basis of whether trainees have a sufficiently long waiting period between the end of BMT and the starting date of their technical training. Basic skills education in this case seems to be used primarily as something that "can't hurt", and it might even help.

Overall, the Air Force uses a decentralized management approach to basic skills education in which each training school and each installation commander decides whether or not to have a basic skills education program, who will be sent to such training, what the curriculum will be, how long the program will be, etc. The IDEA program is standardized somewhat by virtue of Air Force regulations governing the provision of education services. But because such programs are taught by local school districts or other contractors, each program is different and not necessarily most directly focussed on providing the skills Air Force personnel need to complete their career development courses or to perform necessary job reading, writing, and mathematics tasks.

Basic Skills Education in the Army

Of all the Services, the Army conducts the largest basic skills education program (BSEP). Table 13 shows FY81 enrollments in the Army's BSEP I numbered some 18,000, while BSEP II enrollments numbered more than 165,000, including both literacy and English-as-a-Second Language participants.

Like the Air Force, the Army conducts basic skills education at basic military training, technical training, and permanent duty installations. Unlike the Air Force or other Services, however, the Army sometimes combines basic military training with technical training in what is called OSUT-One Station Unit Training. Thus, the term "initial entry training"—IET is used by the Army to refer to both basic military training and technical training, whether these are given separately, as in the other Services, or in combination as OSUT.

The BSEP I program is conducted during initial entry training, while BSEP II is conducted at the duty station. The Advanced Skills Education Program—ASEP, is conducted at duty stations as training to help non-commissioned officers meet the educational skills inherent in their military occupational specialty and to meet their responsibilities as supervisors and leaders.

(1) Basic Skills Education Program (BSEP) I. The BSEP program was designed as the commander's primary on-duty education program to up-grade soldier's job performance and potential through education. BSEP I, conducted during initial entry training, provides soldiers with basic skills training necessary for them to complete initial entry training. BSEP I also provides English as a Second Language (ESL) instruction for soldiers whose native language is not English.

The literacy component of BSEP I is for soldiers who score below the 5th grade level on the SelectABLE, a brief screening test for the Adult Basic Learning Examination. Program content varies by Army training center and military occupational specialties being taught. Building on the FLIT/AITPT research and pilot program (Chapter 2), some installations, such as Fort Dix and Fort Jackson, offer a fully functional BSEP I in which participants spend from 2 hours to 2 days concentrating on a specific skill

needed for advanced individual (technical) training. Other installations offer a more traditional BSEP I consisting of a program of up to six weeks duration to which soldiers are sent. General literacy (reading and arithmetic) materials form the main content, though they may be supplemented to a greater or lesser degree with job-related Soldier's Manuals, Army Regulations, job forms, etc. The English-as-a-Second Language component of BSEP I uses the Defense Language Institute's American Language Course (ALC) as the core curriculum. Emphasis is placed on speaking and listening skills. Each Army Training Center has augmented the ALC with locally developed materials focusing on the language needs of basic training/one station unit training.

Table 15 shows reported gains for BSEP I literacy students on the Tests of Adult Basic Education (TABE) and for the ESL students on the English Language Comprehension Test of the Defense Language Institute. It is notable that the BSEP I — Literacy component gain of .93 is less than one-third that of the Air Force's Remedial literacy program given during BMT, even though the latter is only some 8 days in length in contrast to the modal 30 days of the Army's BSEP I - Literacy.

Basic Skills Education Program (BSEP) II. The BSEP II program is offered at permanent duty stations for personnel reading above the 5th grade level, who have a GT of 90 or below and who score below the 9th grade level in one or more basic skills (reading, arithmetic, spelling, English language usage-grammar, punctuation). Additionally, soldiers who fail their job Skill Qualification Test (SQT), and other commander or self-initiated referrals are made to BSEP II.

The instruction in BSEP II focusses on basic reading or mathematics skills needed to achieve a minimum grade 9.0 level on the Tests of Adult Basic Education (TABE) and to apply these skills to job-related publications (e.g., soldier's technical and field manuals). Actual curriculum materials are provided by contracted educational institutions at each of the 326 Army Education Centers that provide educational services to soldiers.

As with BSEP I, the BSEP II curriculum varies according to the locally contracted educational institution. In Europe, the Army's BSEP program is conducted by means of one large contract with a U.S. educational institution. The curriculum is primarily of a general literacy nature supplemented in an unstructured manner with job and Army life-related materials. At Fort Bliss, on the other hand, BSEP II includes an approach based on the educational needs of adults, as determined by the Adult Performance Level (APL) study of the University of Texas (1979). The Fort Bliss BSEP II aims to teach reading, writing, speaking, listening, mathematics computation, problem solving, and interpersonal relations within the content areas of consumer economics, occupational knowledge, health, community resources, government and law. This program differs from the Europe and other Army (and other Service) general basic skills programs by focusing on content needed for adult living rather than content oriented to passing a GED test or obtaining a high school diploma. As indicated below, the Army is currently moving to combine the Fort Bliss/APL approach with the job-oriented approach of the earlier FLIT/AITPT program to improve the impact of on-duty basic skills education on soldier's job and career advancement.

Advanced Skills Education Program (ASEP). The ASEP aims to provide entry level training in supervising and leadership skills that non-commissioned officers (pay levels E6 and above) need to meet their responsibilities. ASEP-relevant educational subject areas include: Supervision, including personnel supervision and human relations; Management, including basic management, personnel management, military management; and Communication, including oral and written communication skills, technical writing, public speaking, vocational counseling, and related topics. ASEP courses are offered by regionally accredited institutions under contract to the local Army Education Center.

Basic Skills Education in the Army: New Directions. As a result of a 1979 Review of the Army Continuing Education System (ACES), the Office of the Assistant Secretary of the Army (Manpower and Reserve Affairs) recommended the following improvements to BSEP: develop a standardized functional (rather than general literacy) approach to BSEP and find cost-effective ways to teach life-coping skills and learning strategies.

As a consequence of this direction, the Army is currently developing new approaches to BSEP. For instance, BSEP I is undergoing transition to more fully integrate basic skills and military/job training programs as suggested by the research on the FLIT integrated program. Currently, Forts Dix and Jackson have versions of an integrated job skills/basic skills program, now being called "remedial loop" programs that closely link the basic skills training to difficulties soldiers have in initial entry training. The Army's Training and Doctrine Command is conducting task analyses of some 100 Army job training programs to develop a task list of basic skills prerequisites that can be used to develop remedical loop curricula for different military occupational specialties.

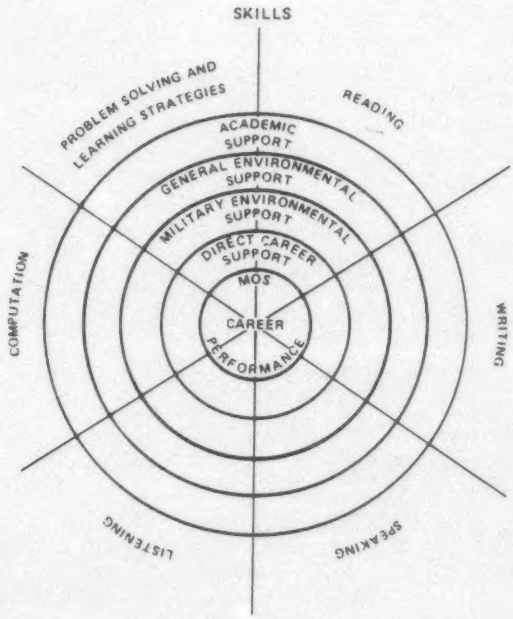
The BSEP II program is undergoing R&D to develop a more standardized curriculum based on the FLIT functional literacy approach combined with the Adult Performance Level (1979) approach modified to make it more relevant to Army work and life demands. This work will replace BSEP II with the Functional Basic Skills Education Program. Based on research conducted in USAREUR by HumRRO under contract to the U.S. Army Research Institute for the Behavioral and Social Sciences, and by TRADOC within the U.S., the Functional BSEP conceptualizes five domains of knowledge within which many soldiers have been found to have serious deficiencies, as evidenced by various performance and personal problems. Figure 6 presents these five domains, and the basic skills needed to work with the knowledge in each domain.

At the center of Figure 6 there are two knowledge domains directly concerned with the soldier's job and career progression. These have highest priority for development. Next there are two domains which support, but are not directly involved with job performance or career progression. Rather, they deal with knowledge which permits the soldier to operate effectively in the military and civilian environments in which he works while not at work. These domains of knowledge have second priority for on-duty basic skills education. Finally, a fifth domain of interest, which is further removed from the direct job performance domain, but is related to career progression, is the domain of academic knowledge needed to secure high school and college credentials either required in the Army for promotion from paygrades E4-E6, or strongly supportive of promotion in higher grades.

An important feature of the Functional BSEP program as it is being conceived is that precedence exists at Fort Bliss for having much of the functional education apply towards a high school diploma. Thus, the potential exists for integrating job technical and support skills training with basic skills development and academic certification, making the Army's on-duty education more effective in contributing both to job performance and career progression, and to soldier's desires and needs for educational credentials.

Basic Skills Programs in the Marine Corps

Unlike the Air Force or Army, the Marine Corps offers no basic skills education programs in basic recruit or job technical skills training. Rather, the first opportunity for basic skills education for Marine recruits comes at the first permanent duty station. There, the on-duty BSEP provides training in English grammar and spelling, mathematics,



DOMAIN DESCRIPTIONS

MOS Career Performance: The actual performance of MOS tasks.

Direct Career Support: Those tasks which are necessary for MOS career promotion and advancement, but do not involve actual job task performance, e.g., appearance before Promotion Board.

Military Environment Support: Those tasks and procedures specific to the Army, which are necessary for successful functioning, but are not directly related to career advancement, e.g., obeying barracks rules.

General Environment and Support: Those competencies a soldier must possess for successful adult functioning which are not specific to the military, e.g., budgeting money.

Academic Support: The basic skills and subject knowledge taught in schools and required for high school graduation which facilitate successful functioning by soldier, e.g., ability to read graphs.

Figure 6. **Army's Functional Basic Skills Education Program: Knowledge Domains and Skills Supporting MOS (Job) Performance.**

reading, and English-as-a-Second Language. The target population is those Marines who are identified by a variety of tests as reading below the 8th or 9th grade, or are identified as being deficient on-the-job due to basic skills problems.

As of the summer of 1981, the Marine Corps offered BSEP at 14 locations through contracts with local educational institutions. Neither curricula nor delivery mode are standardized.

The Marine Corps is monitoring the basic skills programs of all the other Services to identify innovations and approaches which are applicable to Marine Corps needs.

Basic Skills Programs in the Navy

Tables 13-15 outline four basic skills programs conducted by the Navy. The Academic Remedial Training (ART) program is conducted during recruit basic military training, and thus parallels the Air Force's BMT Reading program and the Army's BSEP I. The Job Oriented Basic Skills (JOBS) program is available at several of the Navy's job technical skills training (Class "A") schools as preparatory training for sailors to acquire the prerequisite skills and knowledge needed to meet the learning requirements of "A" school. The Functional Skills Training (FST) program is available both ashore and afloat as the Navy's primary basic skills improvement program offered during on-duty time. The Behavioral Skills Training (BEST) program is available only in the Atlantic Fleet at the Naval Amphibious Base, Little Creek.

(1) Academic Remedial Training (ART). The Navy's three Recruit Training Centers have offered ART programs since 1967. Until 1978, the three programs were all oriented toward general literacy development with no standardization across programs. In 1978 this was changed.

Today, ART programs combine general literacy and job-oriented, functional basic skills training in reading and mathematics. The Navy Training and Analysis Group (TAEG) has developed materials to help Navy personnel contend with the reading and arithmetic demands of recruit training, particularly the academic portion (see Figure 4). Additionally, the ART general literacy curriculum has been standardized to include modules in five areas: decoding, vocabulary, comprehension, reading rate, and study skills. These modules relate to skills assessed by the Stanford Diagnostic Reading Test which is administered to all recruits referred to the ART program from recruit training. Based on this diagnostic testing, recruits are assigned to needed modules for instruction. Successful completion of all criterion tests that indicate mastery of each module assigned enables a recruit to exit from the ART program and to re-enter the recruit training cycle.

As Table 15 indicates, pre- and post-test scores on the Gates-MacGinitie Reading Test, which is administered to all Navy recruits, showed a 2.5 grade level gain in a study by Wisher (1980) at the San Diego RTC. With 24 students, the Gates-MacGinitie RGL changed from 4.3 upon entry, to 6.8 at exit from ART. The wide Range Achievement Test showed a 1.3 RGL gain from an entry RGL of 4.5. These figures can be compared with those for the Air Force and Army, keeping in mind the differences in duration of the programs in the three Services.

(2) Basic Skills Education for "A" Schools. As mentioned above, the Navy conducts two basic skills programs that aim to improve the basic skills of personnel to prepare them for "A" school training: the Functional Skills Training (FST) program and the Job-Oriented Basic Skills (JOBS) program. Inasmuch as the FST is primarily used for a duty station program, and is only used during the "A" school period for personnel waiting to start "A" school, it will be discussed below, in the section on duty station programs.

The Job-Oriented Basic Skills (JOBS) program provides "A" school preparatory training to personnel who are not qualified, by virtue of low Armed Services Vocational Aptitude Battery (ASVAB) test scores, for "A" school technical training. The JOBS program provides training in the prerequisite knowledges and skills needed to satisfactorily learn in "A" school. The aim of the program is to take sailors who are motivated to stay in the Navy, but who lack eligibility for technical training, and give them an opportunity to qualify for a Navy technical trade with good career progression opportunities, and thereby reduce attrition and increase reenlistments of Navy personnel to avoid training investment losses.

Precedence was set for the JOBS program in the Army's AITPT program. Like that program, the JOBS program offers practice and concepts development for performing job-oriented reading and mathematics tasks in instruction that is given in 4 to 8 week programs prior to entering "A" school. Thus, like AITPT, the JOBS program is an add-on to the Navy's training sequence.

The JOBS program was initially developed for four training areas (strands): Propulsion Engineering, Operations, Administrative/Clerical, and Electricity/Electronics (Harding, Mogford, Melching, and Showell, 1981). Based on positive evaluation findings (see below) additional strands are currently being deveioped as the Navy moves the JOBS from an experimental to an operational program.

Evaluation of the JOBS program is still continuing. However, an interim report (Baker and Huff, 1981) indicated that the mean AFQT score of the JOBS students was 28 points lower than those for regular "A" school qualified recruits. Yet, following JOBS training, 75% of the JOBS trainees (492 out of 655) completed "A" school training compared to 87% for regular "A" school students. In all but two schools JOBS students took 8 to 27 percent longer to complete training than did regular "A" school students. In schools having end-of-course comprehensive examinations, JOBS students' scores were 2 to 8 percent lower than those of regular "A" school students.

Follow-up surveys indicated that JOBS and regular "A" school graduates were rated about equally in terms of seven job performance criteria. Eight months after the JOBS and regular "A" school comparison group had completed "A" school, the regular "A" school group had approximately three times as many fleet discharges as did the JOBS group.

While the Navy is moving to operationalize the JOBS program and extend it to include additional Navy jobs, the evaluation of the experimental JOBS program is scheduled to continue to include the study of JOBS graduates in comparison to better defined control groups, and to conduct cost/benefit analysis of the program. At a still later date, research may be undertaken to determine the feasibility of integrating the JOBS training with "A" school training to reduce the need for a 4 to 8 week add-on to the training sequence.

(3) Basic Skills Education at the Duty Station. The Navy's primary on-duty, permanent duty station basic skills program is the Functional Skills Training (FST) program. It was created as a replacement for the Pre-Discharge Education Program (PREP) when that program was terminated in 1976.

The FST program enables permanent duty station personnel, and personnel awaiting "A" school training, who read below grade level 12.9 on several nationally normed tests, to participate in instruction in reading and mathematics when approved by their commanding officers. The program is provided by means of contracts with local educational institutions. There is no specified curriculum or content other than the stipulation that the contractor must furnish 45 hours of instruction to a group of students in one of the basic skills areas: reading, mathematics, spelling, English grammar and science.

Post achievement data suggest that 88 percent of FTS students make about 2 years improvement in reading grade levels. In FY79, the average entry level was 8.9 and the average exit level was 10.8. Enrollments for FY81 are projected at about 22,000, increasing by the end of 1986 to around 30,000 per year.

There are some indications that where FTS is provided for students awaiting "A" school, the school attrition rate is significantly reduced.

The Behavior Skills Training (BEST) Program. The BEST program is available only in the Atlantic Fleet. It is not a basic skills education program that focuses on reading, arithmetic, etc. like other basic skills programs. Rather, the BEST program is for Navy personnel who have a record of behavioral problems: arrests, drug abuse,

disciplinary actions. Some 10,000-20,000 personnel in this category attrite per year. The aim of the BEST program is to reclaim these low and marginal performing first-term enlisted personnel and enable them to successfully complete their obligated service.

The program focuses on what in the Army's to-be-developed Functional BSEP are called Direct Career Support, Military Environment Support, and General Environmental Support. In the BEST program these are called Military Skills Training, Individual Growth, Responsible Living and Decision Making, and Individual Training and Counseling. In civilian adult education programs, many of the same topics are taught as life coping skills. The BEST also includes 70 hours of physical training.

Evaluation of the BEST program is not in terms of pre- or post-test scores, but in terms of job performance factors. For instance, for 344 graduates from BEST evaluated 2 months after graduation, 72% (249) were reported as performing average or above whereas two months prior to BEST, 64% were awarded punishment or court martials. Six month evaluation data for 137 BEST graduates indicates that 57% were performing at average or above, whereas six months prior to BEST 78% were awarded non-judicial punishment or other disciplinary action. Additional evaluation data are being collected to determine the overall effectiveness of the BEST program for reducing attrition due to behavioral "basic skills" problems.

Basic Skills Education in the Services: Achievements

While data on numbers enrolled and costs for basic skills education programs are difficult to compile and to compare due to decentralized management and different accounting categories across the Services, the Defense Audit Service (1981) presents estimates for fiscal year 1979. Table 16 presents data from that study and includes data for fiscal years 1981 and 1980 provided by the Services for the present report.

As Table 16 indicates, expenditures for basic skills education in terms of contract costs declined by 7.7 percent from FY80 to FY81, while enrollments increased by 10 percent. The table indicates that this cost-savings was due primarily to the Army, where enrollments increased by 10 percent while contract costs were reduced some 15 percent from $12.8 million to $10.9 million.

Across the four Services, combined contract and student salary costs increased by more than one-fourth from FY79 through FY81, with some $70 million being spent for basic skills education for more than 220 thousand enrollments in FY81.

Table 17 reports a summary of reading grade level improvement in the basic skills programs conducted by the Army, Navy, and Air Force as reported by the Defense Audit Service (1981). Again, it should be recalled that the different Services use different tests for selection and different entry level scores, thus there is no way of knowing how comparable gain scores are across the Services. The Defense Audit Service study also makes the point that much of the gain reported in Table 17 may be lost not long after basic skills training is completed.

It is of interest to compare the gain in the military programs to gain in civilian basic skills programs. Again, however, because of differences in tests, selection policies, and instructional treatment this is risky and results must be regarded with due caution.

The report on a Target Population in Adult Education (National Advisory Council on Adult Education, 1974) reports that, typically for persons who enter adult basic skills programs reading in the grades 1-3 or 4-6 range, one can expect about 1 years gain for 100 hours of instruction. For students entering in the 7-8 grade range, a gain of about 1 year in 80+ hours was reported.

Table 16

Armed Forces Basic Skills Program Enrollments and Costs

Service	Fiscal Year	Course Enrollments[a]	Contract Costs[b]	Student Salary Cost[c]	Total Cost
Air Force	1981	13,815	$ 1,600	$ 2,323	$ 3,923
	1980	12,282	1,233	2,065	3,298
	1979	13,784	1,321	2,318	3,639
Army	1981	174,733	10,924	46,924	57,848
	1980	159,176	12,893	42,746	55,639
	1979	126,639	11,048	34,009	45,057
Marine Corps	1981	6,894	710	1,147	1,857
	1980	11,108	839	1,848	2,687
	1979	9,800	978	1,631	2,609
Navy[d]	1981	25,000	2,200	4,584	6,784
	1980	17,500	1,770	3,208	4,978
	1979	16,285	1,016	2,986	4,002
Total	1981	220,442	15,434	54,978	70,412
	1980	200,066	16,735	49,867	66,602
	1979	166,508	14,363	40,944	55,307

[a]Enrollments refer to courses enrolled in. One participant may have enrolled in more than one course. Thus enrollments are not the same as number of different participants.

[b]Data for FY 1981 and 1980 provided by Services. FY 1979 data from a Defense Audit Service report published in 1981. Dollars are in thousands.

[c]Data for FY 1981 and 1980 estimated using the FY 1979 student cost data reported by the Defense Audit Service, 1981. No cost-of-living corrections were applied.

[d]Navy data for FY 1981 and 1980 are in the Functional Skills Training (FST) program only. FY 1979 data are from Navy sources, not Defense Audit Service, 1981 study.

Table 17

Basic Skills Education Program Gains in Reading Grade Levels[a]

Service	Enrollments Reviewed	Improvement in Grade Levels			
		Less Than One Grade		One Grade or More	
		Number	Percent	Number	Percent
Army	1,205	505	42	700	58
Navy	265	31	12	234	88
Air Force	538	198	37	340	63

[a]Defense Audit Service, 1981.

This finding of roughly one year of gain for 80-100 hours of instruction is consistent with a Ford Foundation review (Schrank and Stein, 1970) of thirteen programs (including a military program) that reported that, on the average, 90 hours of training was required to achieve one year's gain in reading. The minimum number of hours for one year of gain was 25, while elsewhere the same commercial program produced one year of gain in 88 hours—over three times the instruction for the same gain.

A study of the U.S. Department of Education funded Reading Academy Program in 1977-78 reports gains for 21,555 students from 67 programs in over 30 states. In the typical case, Academies post-tested after 20-40 hours of instruction using either the Adult Basic Learning Examination (ABLE), Tests of Adult Basic Education (TABE), or Wide Range Achievement Test (WRAT). On the average, students entering reading in the 0-3 range gained 1.92 grade levels (n = 11,270), while those entering in the 4-6 or 7-9 grade level range gained 2.25 years. Overall gain was 2.06 years. These gains, in 20-40 hours of instruction are comparable to those reported by the Air Force using the TABE (Table 15, Column 4), and exceed the data for the other Services and civilian programs reported above.

Many of the Reading Academy programs provide one-to-one tutoring, unlike the military programs, but similar to other volunteer reading tutoring programs. Stauffer (1973) reports a study of the effectiveness of tutoring by the National Affiliation for Literacy Advance (NALA). For 272 tutees, 30% gained +0.1 to +1.0 grade levels, while 27% gained +1.1 to +2.0, and 10% gained more than 2 years. Zero or negative gain was made by over 30% of tutees. In this study, instruction was for a maximum of 50 hours, while the median hours of tutoring received was 26-30.

Perhaps the best programs to which to compare the military basic skills programs are those of the Job Corps. Geller (1982) reported reading gain data for 1603 Job Corps trainees from 5 Job Corps centers serving different national regions. In terms of gain per hour, the average was .019 years gain per hour of instruction, or approximately 2 years for 100 hours of instruction. In this case, average entry and exit scores were approximately 5 and 7, using the Stanford Achievement Test.

The foregoing Job Corps data are for trainees in the Job Corp's individualized instruction program using paper-and-pencil materials. For 97 Job Corps trainees who used computer-based instruction, a gain score of 1.6 RGL was reported for an average of 54 hours of instruction.

Overall, then, the data comparing basic skills programs that civilian educators offer to both military[1] and civilian students indicate great variability in tests and materials used, instructional methods and duration, and outcomes achieved. Most of the programs report no data on how much gain is retained, though it is clear from the FLIT research reported earlier that much of the gain in general literacy, perhaps as much as 40-50%, may be lost within two months after leaving a basic skills program. The Defense Audit Service (1981) also reports significant losses in general literacy gains for Army basic skills program graduates. Within this overall variability, the programs for military clients seem neither better nor worse than those for civilian clients in affecting change in general literacy.

[1] It should be noted that, as indicated in Table 14, nine out of the 15 basic skills programs offered by the Services are taught by civilian adult educators under contract to the military. These nine programs include over 90% of the enrollments.

Job Oriented Basic Skills Programs. Making gain on a general literacy test is not the primary goal of basic skills education in the military. Rather, the goal is to improve basic skills so that job tasks requiring basic skills can be performed more effectively. In this regard, the Army's earlier Advanced Individual Training Preparatory Training (AITPT), the Air Force's earlier Job Oriented Reading Program (JORP), and the Navy's current Job Oriented Basic Skills (JOBS) program indicate that it is possible to improve the performance of job reading and arithmetic tasks through direct instruction in such tasks. The Army's Functional Literacy (FLIT) study indicated that improved job reading task performance skills were retained better than general literacy skills, and the Navy's JOBS program is demonstrating that job-oriented, prerequisite skills training can render unqualified sailors qualified and successful in technical training and on the job.

Chapter 4

BASIC SKILLS IN DEFENSE: SUMMARY AND CONCLUSIONS

For some two hundred years a "great debate" has taken place among those responsible for military manpower accession, training, and education policy. This debate focuses on the role of the military in providing basic education for undereducated applicants for military service. Some argue "yea", others "nay". And while the debate goes on, the Services currently provide basic skills education for some 200+ thousand enrollments a year at a cost in instruction and student time exceeding $70 million.

Arguments in the great debate were examined as issues in three areas: selection and classification, job training, and job performance. Evidence was cited to support the following conclusions.

REGARDING SELECTION AND CLASSIFICATION

(1) The military services pose demands for basic skills equal to or greater than those of civilian jobs, and therefore they cannot accommodate less capable people than can other segments of society, e.g., industry and business.

(2) The revised Armed Forces Qualification Test (AFQT) is now comprised of a Reading (Vocabulary and Paragraph Comprehension) component and a Mathematics (Basic Computation and Arithmetic Reasoning) component. As such it provides the military with a screening test for basic skills.

(3) Reading levels of military accessions are now approximately the same as the young population from which the military recruits. This results from the use of the new AFQT as a basic skills screening test, and the setting of higher standards for enlistment.

(4) However, as in the civilian world, many military recruits are low in basic skills, including listening skills. Native language comprehension, learning skills, and not just reading are problems for the least able enlistees.

(5) It is difficult to accurately measure the learning potential of applicants for military service, even with the revised and refined Armed Services Vocational Aptitude Battery.

REGARDING TRAINING

(6) Attrition is highest for those lowest in basic skills, and is more highly related to the demands for basic skills use during "academic" as contrasted with "performance" phases of training. Yet, the majority of the least capable did not attrite from either phase of training in the studies reviewed.

(7) Removing reading demands of training by substituting listening or one-on-one, audio-visually supported live instruction did not remove learning differences between groups of trainees scoring high or low in basic skills in the studies reviewed. Yet many of the least skilled learn as well as the most skilled on a variety of military tasks.

REGARDING JOB PERFORMANCE

(8) AFQT, reading, listening, and arithmetic skills are positively correlated with paper-and-pencil job knowledge tests and hands-on job sample tests such as used in the Army's Skill Qualification Testing program. Yet in work reviewed many of the highest skilled were in the bottom half of performers on hands-on tests, while many (e.g., 33%) of the least skilled were in the top half of performers on such tests.

(9) The most highly skilled non-high school graduates in one study had a job success rate equal to those having the lowest basic skill levels among high school graduates. Thus basic skills competence, per se, does not appear to be the overriding determinant of success in the military.

(10) All Services have education credential requirements for non-commissioned officer ranks which, if not satisfied, lessen the chance for career progression to positions of leadership.

A review of basic skills policies and practices in the Department of Defense and the Services revealed the following.

REGARDING BASIC SKILLS POLICY

(11) The Congress has directed that high-school diploma programs be attended only during off-duty time and that only job-related remedial basic skills education can be conducted during duty hours. But the meanings of "job-related" or "duty time" terms are unspecified by the Congress.

(12) The DoD follows a policy of decentralized management of the Services and directs that "Educational programs shall be established to provide opportunities for military personnel to achieve educational, vocational, and career goals . . ." (DoD Directive, Number 1322.8, February 4, 1980). This same directive defines off-duty time as "Time when the Military Service member is not scheduled to perform official duties." Since military service commanders are responsible for the scheduling of official duties, this definition of off-duty time permits the Services great flexibility in adhering to Congressional and Department of Defense directives.

(13) Within each of the armed services, then, policies of decentralized management act to guide the formulation of regulations that govern how each Service follows the Department of Defense policy regarding basic skills education. Flexibility is permitted by the language used in the Department of Defense Directive cited above. This allows local commanders to tailor basic skills programs and participation to the needs of their mission and assigned personnel.

(14) Military services are given considerable latitude in determining what will be taught as basic skills. The Department of Defense directive states, regarding basic skills educational programs that, "for effective performance of duty assignments, Military Service members must have competency in the basic skills of reading, writing, and speaking in English, as well as computational skills. Opportunities for study to achieve sufficient competency for effective job performance and for promotional opportunities shall be provided. Basic skills educational programs include "English as a Second Language." Aside from this guidance, the Services are free to decide what levels of basic skills instruction to give, what the content of the basic skills will emphasize (e.g., general education development versus job-oriented literacy), what materials and procedures will be used, and how the delivery system will be configured and operated.

REGARDING BASIC SKILLS PROGRAMS IN THE MILITARY

(15) There is a kaleidoscopic array of basic skills programs in operation in the military, with others under development. Each Service establishes different kinds of on-duty basic skills programs, with different criteria for entry, different criteria for exiting, different assessment devices, different length of instruction, decentralized management, little systematic evaluation, assorted materials, and they obtain gains in reading ranging from less than one grade level to almost three grade levels, with no apparent relationship of gain to time or resources.

(16) Basic skills programs appear to serve a multiplicity of functions. On the one hand, they appear to exist as part of the education enticement package the military services use for recruitment. For many service members, basic skills programs are the road to a high school diploma and higher education. As a part of the educational credentialing system, the basic skills programs are to be attended only in off-duty time, consistent with the directives of the Congress. On the other hand, in keeping with Congressional and Department of Defense directives, the basic skills programs are meant to prepare personnel with the basic skills needed to learn and to perform military jobs. They are to improve military job-related basic skills (the Army BSEP program); enhance learning ability, speedup progression through the ranks, reduce behavioral problems (the Navy BEST program); develop NCO leadership potential (the Army ASEP program); and improve "understanding of adult values and responsibilities" (the Air Force STEP program). Because these skills may be defined as job-related, as in the Department of Defense directives, learning them may be defined as an official duty, and programs teaching them can be offered during duty hours.

(17) Over 95% of the trainees who receive basic skills education attend programs designed by and delivered by civilian educational institutions under contract to the military. Comparisons of the gains made by civilians teaching military students to civilians teaching civilian students indicate that the programs for the military achieve in the same, highly variable manner as do the programs for civilians. A gross estimate of expected achievement in such adult basic education programs is one grade level for 80-120 hours of instruction, with wide variation within this range.

(18) To date, only the military programs that focus directly on the teaching of job-specific literacy tasks have demonstrated a positive and enduring effect of literacy training on job performance—if the performance of job reading tasks is considered as job performance (Army's AITPT, Air Force's JORP; and Navy's JOBS programs). Interim evaluation of the Navy's JOBS program suggests that attrition rates in technical training and the months beyond may be reduced due to job-oriented prerequisite training.

CONCLUSIONS

At the present time, the great debate is unresolved. Consequently, though the military services are directed by the Department of Defense to make basic skills education available, the programs are to be voluntary and conducted off-duty if they are aimed at high school completion, and on-duty if they are aimed at improving job learning or performance. The final responsibility for actually implementing and utilizing basic skills programs is delegated through each military service chain of command down to the level of an installation commander. If the commander is "for" basic skills education, such programs may flourish, though they may grow in a number of directions, as indicated in Chapter 3. If the installation commander is "against" basic skills education, such programs are likely to be undersupported and underutilized.

In this debate, then, there may be something of the nature of a self-fulfilling prophecy. If leadership is "for" basic skills education, it may be successful. If leadership is "against" basic skills education, it may fail. The debate has endured for two hundred years, and adult basic skills education, both in and out of the military has suffered. Yet, there are signs that the new functional approaches to adult basic education that are emerging may, when fully incorporated into the military, render the debate moot.

If the trend toward functional or job-oriented basic skills training continues in the military, it may be possible to show more systematic improvement of skills in performing job-related basic skills tasks as the first line of evidence for the effectiveness and utility of basic skills training. If basic skills programs cannot demonstrate that they improve the performance of job tasks involving reading, arithmetic, and other basic skills, then it is difficult to understand why such non-improvement of basic skills should be expected to affect learning in technical school or performance on the job.

If the trend toward integrating job-oriented basic skills education with job technical skills training and military performance continues, as in the Army's projected "remedial loop" programs in initial entry training and Functional Basic Skills Education Program at the duty station, the distinction between basic skills and technical skills training will diminish. The basic skills programs will be viewed more as extended technical training, in which instruction is available for a wider range of recruits.

Similarly, if functional basic skills programs can simultaneously provide job-relevant skills and contribute toward the satisfaction of high school credential requirements, as the Army's projected Functional Basic Skills Education Program aims to do, then the distinction between on-duty basic skills training and off-duty education for career-progression will diminish.

If the trend toward job-and career-oriented basic skills education proceeds as suggested above, then the great debate will have resolved itself. The distinctions between basic skills, technical skills and high school completion programs will blur, and in the place of separate programs there will emerge one systematic approach to skill development that accepts a wide spectrum of skills in incoming recruits, meets the recruit at his or her skill level, and systematically educates and trains the recruit in the knowledges and skills that will permit him or her to contribute most profitably to the goals of national defense and personal accomplishment.

REFERENCES

Adult Performance Level Project Staff, *The Adult Performance Level Competency-Based High School Diploma Program*, Austin, Texas: University of Texas, 1979.

Baker, M. and Huff, K. *The Evaluation of a Job-Oriented Basic Skills Training Program — Interim Report.* NPRDC TR 82-14, San Diego, CA: Navy Personnel Research and Development Center, November 1981.

Burkett, J. and Hooke, L. *Analysis of the Functional Literacy Requirements of Air Force Jobs.* Paper presented at the American Psychological Association meetings, September 1979.

Chall, J. *Learning to Read: The Great Debate.* New York: McGraw-Hill, 1967.

Curran, T. (Ed.) *Tri-Service Literacy and Readability: Workshop Proceedings.* NPRDC Special Report 80-12, San Diego, CA: Navy Personnel Research and Development Center, March 1980.

Defense Audit Service, *Report on the Review of Installation — Sponsored Education Programs for DoD Personnel.* Report No. 81-041, January 1981.

Duffy, T. Literacy Research in the Navy. In: T. Sticht and D. Zapf (Eds.) *Reading and readability Research in the Armed Services.* HumRRO FR-WD-76-4. Alexandria, VA: Human Resources Research Organization, September 1976.

Duffy, T. and Nugent, W. *Reading Skill Levels in the Navy.* NPRDC TR 78-19, San Diego, CA: Navy Personnel Research and Development Center, April 1978.

Fisher, A. *Army "New Standards" Personnel: Effects of Remedial Literacy Training on Performance in Military Service.* Technical Report MD-TR-71-13, Brooks, AFB: Air Force Human Resources Laboratory, Manpower Development Program Office, 1971.

Fletcher, J. Historical Perspective on Literacy Training in the Navy. In: T. Sticht and D. Zapf (Eds.) *Reading and Readability Research in the Armed Services.* HumRRO FR-WD-CA-76-4, Alexandria, VA: Human Resources Research Organization, September 1976.

Fox, W., Taylor, J. and Caylor, J. *Aptitude Level and the Acquisition of Skills and Knowledges in a Variety of Military Training Tasks.* HumRRO TR 69-6, Alexandria, VA: Human Resources Research Organization, May 1969.

Geller, D. *Personal Communication.* Washington, D.C.: TEAM Associates, Jobs Corps Educational Improvement Effort, Department of Labor, November 1981.

Ginzberg, E. and Bray, D. *The Uneducated.* New York: Columbia University Press, 1953.

Glaser, R., Pellegrino, J., and Lesgold, A. Some Directions for a Cognitive Psychology of Instruction. In: A. Lesgold, J. Pellegrino, S. Fokkema, and R. Glaser (Eds.) *Cognitive Psychology and Instruction.* New York: Plenum Press, 1978

Goffard, J. *An Experimental Evaluation of a Basic Skills Education Program in the Army.* HumRRO TR 28, Alexandria, VA: Human Resources Research Organization, April 1956.

Goldberg, S. *Army Training of Illiterates in World War II.* New York: Columbia University Press, 1951.

Goodman, K. (Ed.) *The Psycholinguistic Nature of the Reading Process.* Detroit: Wayne State University Press, 1968.

Hagen, E. and Thorndike, R. *A Study of W.W. II Navy Careers of Illiterates Sent Through Literacy Training,* Research Report, Classification and Survey Research Branch, Bureau of Naval Personnel, Washington, D.C., 1953.

Harding, S., Mogford, B., Melching, W., and Showell, M. *The Development of Four Job-Oriented Basic Skills (JOBS) Programs.* NPRDC TR 81-24, San Diego, CA: Navy Personnel Research and Development Center, September 1981.

Hiatt, C. and Sims, W. Armed Services Vocational Aptitude Battery (ASVAB) and Job Performance. In: *A Report to the House and Senate Committees on Armed Services, Implementation of New Armed Services Vocational Aptitude Battery and Actions to Improve the Enlistment Standards Process.* Washington, D.C. Office of the Assistant Secretary of Defense, (Manpower, Reserve Affairs, and Logistics) December 1980.

Huff, K., Sticht, T., Joyner, J., Groff, S., and Burkett, J. *A Job-Oriented Reading Program for the Air Force: Development and Field Evaluation.* HumRRO FR-WD-CA-77-3, Alexandria, VA: Human Resources Research Organization, May 1977.

Hungerland, J. and Taylor, J. *Self-Paced Instruction in a Cognitively Oriented Skills Course: Supplyman, MOS 76y10.* Alexandria, VA: Human Resources Research Organization, June 1975.

Larson, G. *The Effects of Basic Literacy Training on Performance in Occupational Training Programs in the U.S. Army.* Ed. D. Dissertation, Rutgers University, New Brunswick, New Jersey, May 1979.

Marginal Man and Military Service: A Review. Washington, D.C., Department of the Army, December 1965.

Mathews, J., Valentine, L., and Sellman, W. *Prediction of Reading Grade Levels of Service Applicants from Armed Services Vocational Aptitude Battery (ASVAB).* AFHRL-TR-78-82. Brooks AFB: Air Force Human Resources Laboratory, December 1978.

McGoff, R. and Harding, F. *A Report on Literacy Training Programs in the Armed Services.* AFHRL TR-73-69. Brooks AFB: Air Force Human Resources Laboratory, 1973.

Mikulecky, L. and Diehl, W. *Job Literacy.* Bloomington, Indiana: Reading Research Center, February 1980.

Miller, E., Nystrom, C., and Hicks, J. *Reading Ability and Other Correlates of the SQT Written Component.* HumRRO FR-MTRD(TX)-80-1. Alexandria, VA: Human Resources Research Organization, March 1980.

Mockovak, W. *An Analysis of Air Force Reading Improvement Programs: Results of USAF Survey Number 73-89.* AFHRL-TR-73-54. Lowry AFB: Air Force Human Resources Laboratory, January 1974.

National Advisory Council on Adult Education. *Target Population in Adult Education.* Washington, D.C., 1974.

Office of the Assistant Secretary of Defense (Manpower, Reserve Affairs, and Logistics). *Implementation of New Armed Services Vocational Aptitude Battery and Actions to Improve the Enlistment Standards Process,* Washington, D.C., December 1980.

O'Neil, Jr., H. (Ed.) *Learning Strategies.* New York: Academic Press, 1978.

O'Neil, Jr., H. and Spielberger, C. *Cognitive and Affective Learning Strategies.* New York: Academic Press, 1979.

Reading Academy Performance Report. Unpublished Manuscript, Basic Skills Improvement Program, U.S. Department of Education, Washington, D.C.: 1978.

Robinson, H. Training Illiterates in the Army. In: F. Lanning and W. Many (Eds.). *Basic Education for the Disadvantaged Adult: Theory and Practice.* Boston, MA: Houghton-Mifflin, 1966.

Sachar, J. and Baker, M. *Mathematical Requirements in Navy Class "A" Electronics Schools.* NPRDC TR 81-4, San Diego, CA: Navy Personnel Research and Development Center, 1981.

Sacher, J. and Duffy, T. *Reading Skill and Military Effectiveness.* Paper presented at the American Educational Research Association meetings, 1977.

Schrank, R. and Stein, S. *Basic Education: What Are the Realistic Possibilities.* In: Training in Business and Industry, June 1970.

Stauffer, J. Illiteracy in the United States: The Move to Voluntarism, *Literacy Discussion,* 1973, 4, 251-283.

Sticht, T. Learning by Listening. In: R. Freedle and J. Carroll (Eds.) *Language Comprehension and the Acquisition of Knowledge.* Washington, D.C.: V.H. Winston & Sons, 1972.

Sticht, T. (Ed.) *Reading for Working.* Alexandria, VA: Human Resources Research Organization, 1975.

Sticht, T. *A Program of Army Functional Job Reading Training.* HumRRO FR-WD-CA-75-7. Alexandria, VA: Human Resources Research Organization, June 1975.

Sticht, T. The Acquisition of Literacy by Children and Adults. In: F. Murray and J. Pikulski (Eds.) *The Acquisition of Reading.* Baltimore, MD: University Park Press, 1978.

Sticht, T. Developing Literacy and Learning Strategies in Organizational Settings. In: H. O'Neil, Jr. and C. Spielberger (Eds.) *Cognitive and Affective Learning Strategies.* New York, Academic Press, 1979.

Sticht, T. *Evaluation of the "Reading Potential" Concept for Marginally Literate Adults.* HumRRO FR-ETSD-82-2. Alexandria, VA: Human Resources Research Organization, January 1982.

Sticht, T. and Zapf, D. *Reading and Readability Research in the Armed Services.* HumRRO FR-WD-CA-76-4. Alexandria, VA: Human Resources Research Organization, September 1976.

Sticht, T., Hooke, L., and Caylor, J. *Literacy, Oracy, and Vocational Aptitude as Predictors of Attrition and Promotion in the Armed Services.* HumRRO FR-ETSD-81-11. Alexandria, VA: Human Resources Research Organization, September 1981.

Sticht, T., Caylor, J., Kern, R., and Fox, L. *Determination of Literacy Skill Requirements in Four Military Occupational Specialties.* HumRRO TR 71-23. Alexandria, VA: Human Resources Research Organization, November 1971.

Sticht, T., Fox, L., Hauke, R., and Zapf, D. *Reading in the Navy.* HumRRO FR-WD-CA-76-14, Alexandria, VA: Human Resources Research Organization, September 1976.

Training and Doctrine Command (TRADOC), U.S. Army, *Evaluation of BSEP/ESL* (approximate title). Fort Monroe, VA: February 1981.

Vineberg, R. and Taylor, E. *Performance in Four Army Jobs by Men at Different Aptitude (AFQT) Levels: 3. The Relationship of AFQT and Job Experience to Job Performance.* HumRRO TR 72-22. Alexandria, VA: Human Resources Research Organization, August 1972.

Weinert, R. *Literacy Training in the Army.* TRADOC Historical Office, Fort Monroe, VA, 1979.

Wisher, R. *Computer-Assisted Literacy Instruction in Phonics.* NPRDC TR 80-21. San Diego, CA: Navy Personnel Research and Development Center, April 1980.

Zaccaria, M. *Effectiveness of the Basic Military Reading Proficiency Training Program,* Unpublished Air Force Report, circa 1971.

Wagner, M., Dirmeyer, R., Means, B., and Davidson, M. *Analysis of Aptitude, Training, and Job Performance Measures.* Final Report Contract No. MDA 903-80-C-0440. Washington, D.C.: McFann Gray Associates, February 1982.